APRIL 21, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

UNCLE SAM TAPS THE TILL

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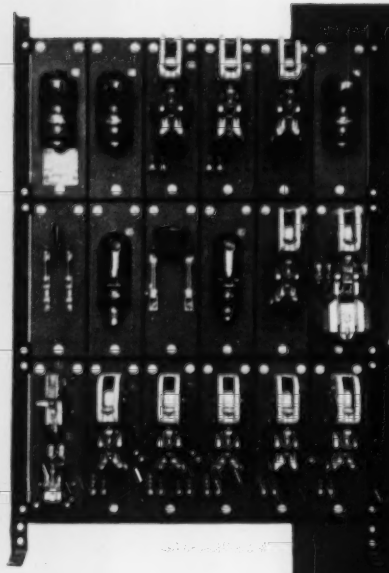
FOUR-TO-ONE SPLIT: $1223 Million for Taxes, $296 Million for Shareholders



LOOK for these NAMES when buying Motor Control

1 LINE-ARC Contactors
2 TIME-CURRENT Acceleration (D-c)
3 FREQUENCY RELAY Acceleration (A-c)
4 WRIGHT CIRCUIT Hoist Control (D-c)
5 YOUNGSTOWN Hoist Limit Stops
6 TYPE WB Brakes
7 CAM Master Switches
8 MANUAL-MAGNETIC Disconnect Switches
9 CONTRA-TORQUE Hoist Control (A-c)
10 TAB-WELD Resistors

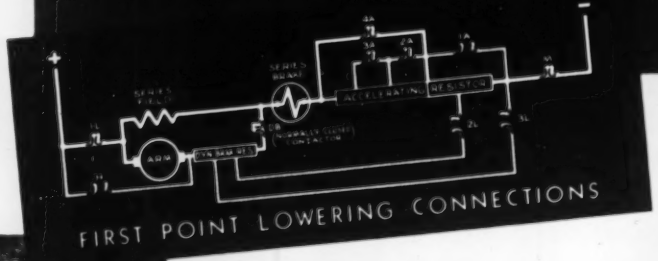
These FUNCTIONAL NAMES Speak for Themselves

WRIGHT DYNAMIC-LOWERING CIRCUIT for D-c CRANE HOISTS

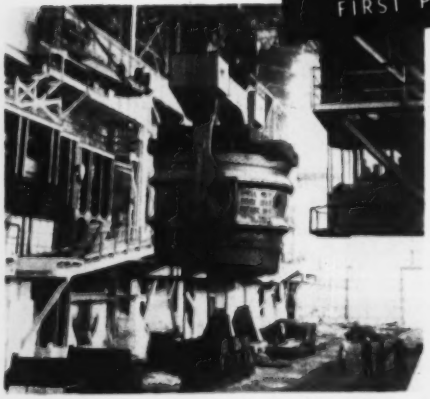
The Wright Circuit is SAFE

Provides more accurate handling because simplified controller gives fast response.

All lowering points under direct control of the operator.



FIRST POINT LOWERING CONNECTIONS



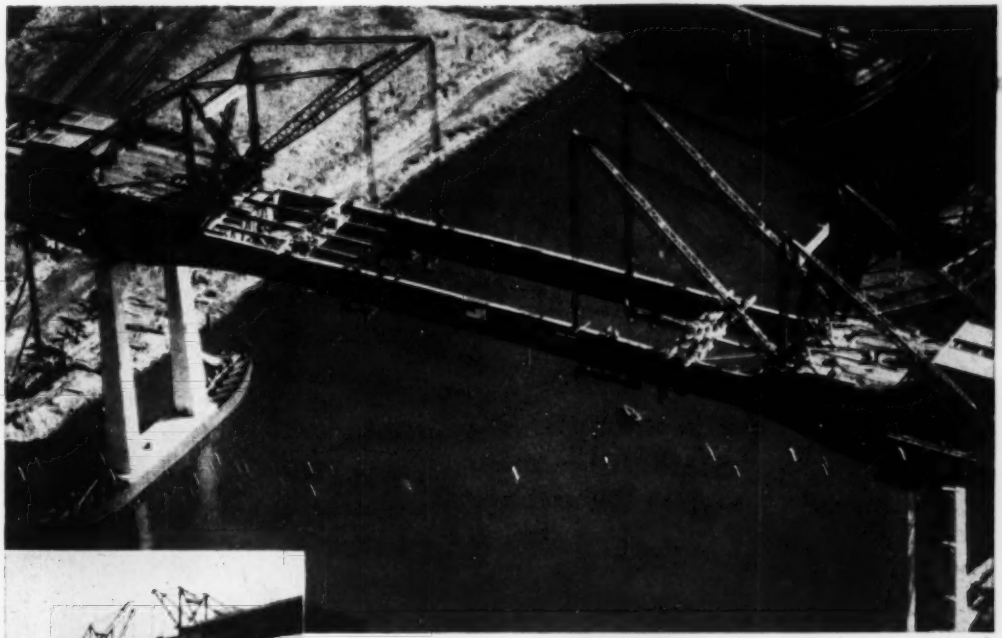
460-Ton test load successfully handled on this 300-Ton Ladle Crane, equipped throughout with EC&M Control.

Highly regarded for its trouble-free, high output performance, the EC&M Wright Circuit HOIST Controller provides safe, accurate raising and lowering of all loads.

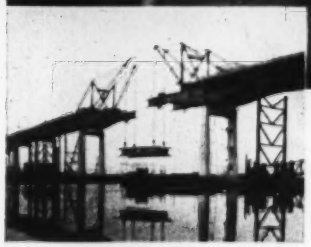
In the hoisting direction, the first point gives slow speed for contacting and starting light loads up without jar. In the down direction, the first point lowering connections, shown above, give quick response for accurate spotting of all loads. Note that *all* the current taken from the line goes through the brake coil for fast brake release. Also, the operator has direct control (from the Master Switch) of all loads in the lowering direction.

When buying cranes, specify the EC&M Wright Circuit Hoist Controller.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO



Aerial view of six-lane Passaic River Bridge, showing Bethlehem Steel crew fitting closing girders into place. *Owner:* New Jersey Turnpike Authority; *Chief Engineer:* Charles M. Noble; *Former Executive Director:* W. W. Wanamaker; *Consulting Engineers:* Ammann & Whitney, New York; *General Consulting Engineers:* Howard, Needles, Tammen & Bergendoff, New York.



Travelers on bridge deck, each equipped with two booms, shown raising twin 115-ft closing girders, having a combined weight of 292 tons.

One of four haunch girders, erected over main piers at night because of tide conditions. Girder is 130 ft long, 22 ft deep, weighs 173 tons.

New Jersey Turnpike Crosses Passaic River

Shown under construction, the giant Passaic River Bridge is an important link in the New Jersey Turnpike, the 118-mile limited-access high-speed highway traversing the state. The bridge crosses the river and twenty railroad tracks, and passes beneath the Pulaski Skyway. Over the river it has an under clearance of 110 ft from mean high water. Its approaches extend from a point south of Raymond Boulevard, in Newark, to approximately 800 ft beyond the Newark Turnpike, in Kearny.

The south approach superstructure for the Passaic River Bridge consists of nineteen simply-supported deck-girder spans for an overall length of 2,526 ft. The north approach superstructure has twenty-four similar spans, covering a distance of 3,055 ft.

The 1,365-ft main river portion of the bridge, also of the deck-girder type, consists of five spans. Here the three interior spans are continuous over four supports, with the two extremities cantilevered to carry the two end simply-supported suspended spans.

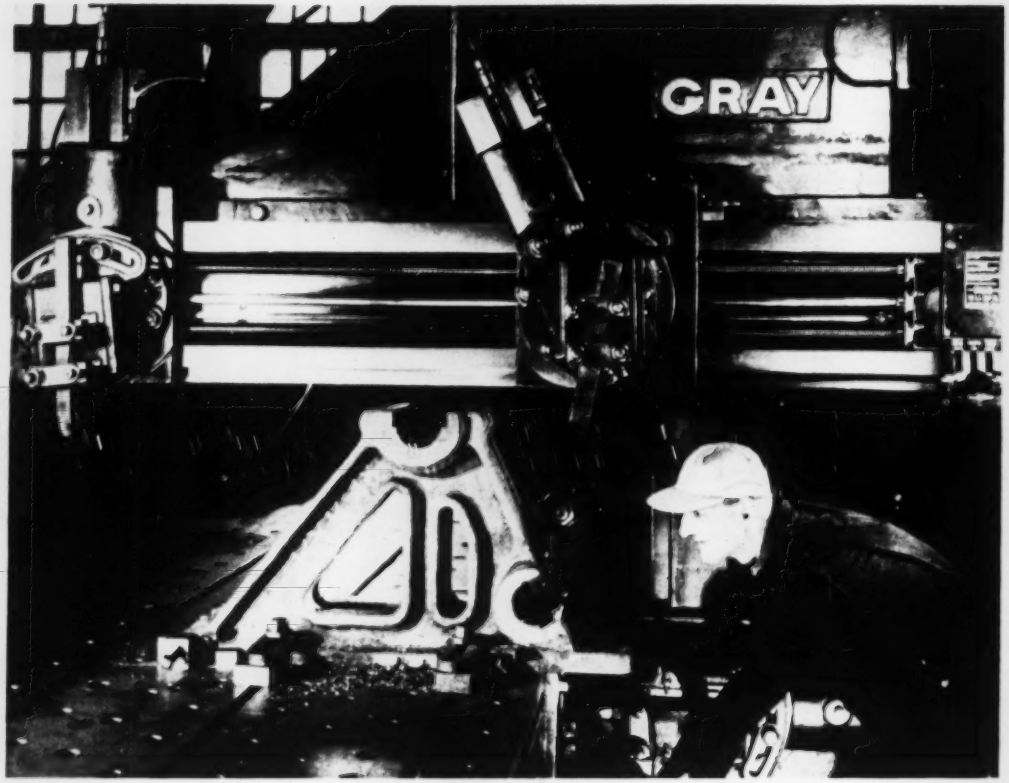
The Passaic River Bridge has two reinforced concrete roadways, each 36 ft wide, plus a central mall and safety walks. Its 7,000-ft length and 22,000-ton superstructure make it the largest of 24 Turnpike bridges for which Bethlehem fabricated and erected the steelwork.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

FABRICATED STEEL CONSTRUCTION



His smooth handling brings you better materials-handling

The operator of this giant planer at Barium's Clyde Iron Works, Inc., is really making things smooth for you.

For the steel casting his planer is smoothing off is typical of castings being used by Clyde in fabricating the finest modern materials handling equipment . . . Whirley cranes, hoists, winches, derricks . . . as well as pile drivers and road rollers.

Whether you need an end-product or raw material, if it's steel, one or more of Barium's fifteen subsidiaries can probably supply you.

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STEEL PLATE
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PIG IRON
Chester Blast Furnace

CRANES AND HOISTS
Clyde Iron Works, Inc.

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BOLTS AND NUTS
Erie Bolt and Nut Company

METAL STAMPINGS
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DROP FORGINGS
Globe Forge, Inc.

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This Week in Metalworking

STEEL

Vol. 130 No. 16 April 21, 1952

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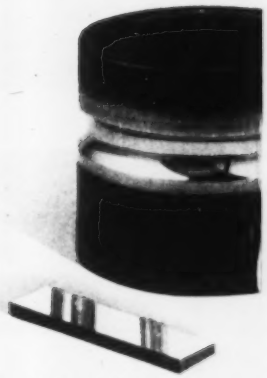

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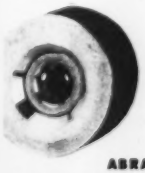

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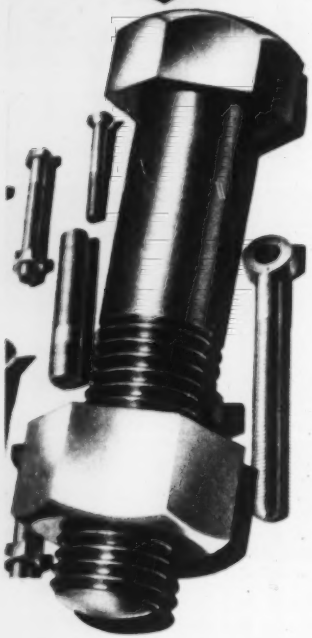
ABRASIVES DIVISION

ELGIN NATIONAL WATCH CO.

Elgin, Illinois

First for
BOLTS
NUTS
STUDS



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THE PLACE TO SOLVE YOUR BOLT PROBLEMS
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On the Record

STEEL's widely acclaimed article "Metalworking's Destiny," which appeared in the yearbook issue of Jan. 7, has been reprinted in the Mar. 20 issue of the *Congressional Record*.

It was pointed out to Congresswoman Frances P. Bolton by Harry W. Barkley, president of National Tool Co., Cleveland. He says the theme of the article "is echoed by countless businessmen throughout the country." He indicates that although the article is written in terms of the metalworking industry, it bespeaks a problem more universal even than that fundamental branch of our economy.

Mrs. Bolton says: "Having studied it carefully, and believing that every member of Congress and as many of our people as possible should be aware of the simple but profound message which it points up, I ask that the entire article be reprinted."

Answers

Getting answered is the problem of getting answers to all those questionnaires. The market research department of G. M. Basford Co. thought up a system to get good returns. It pinned a crisp dollar bill to a questionnaire sent to 282 production executives in metal-working industries.

The dollar was not to "buy" cooperation; it was to buy a cigar in return for same. The researchers (maybe by sending out another questionnaire) figured no secretary could hold up the dollar bill and that the recipient would be intrigued enough to read and probably to answer the thing.

Pride and Joy

To the east of here is one of STEEL's pride and joys, its annual financial analysis of the steel industry. Assistant Editor Sam Baker shepherded the job through this year, and Associate Editor Vance Bell acted in an advisory capacity. The summary gives you accurate, complete information obtainable no where else—far more than just the data found in the steel companies' annual reports.

Thirty companies are included this year, representing 95.4 per cent of the industry's total productive capacity. One firm, Newport Steel Corp., is carried for the first time. This is the 27th annual analysis that STEEL has worked up. This time, the layout is changed a little to permit better grouping of the various facts presented.

Women Do Better

We have just run across a fact that comes as a surprise. Women drivers have far fewer accidents than men. Of course they drive less than men, but the figures (arabic, we mean) are still impressive.

According to Travellers Insurance Companies, women in 1951 accounted for only 7 per cent of all fatal accidents and only 10.7 per cent of all non-fatal accidents.

Puzzle Corner

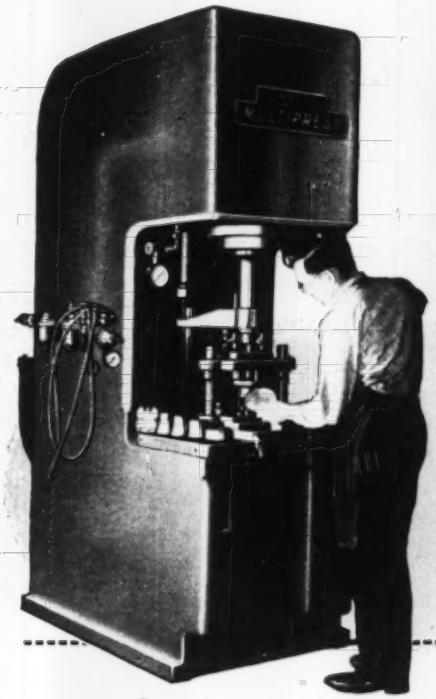
In the animal question of last week, the farmer received 5 pigs, 1 chicken and 94 rabbits for his $100. First in with that correct answer were Ralph Pappenheimer of Specialty Device Co., Lewis D. Rice of Timken Roller Bearing Co., E. R. Spahn of Dupage Boiler Works Inc., R. T. Phipps of Underwood Corp., T. S. Bean of Barber & Ross Co., JoAnne G. Ketcham of Ohio State University, E. J. Hresko of Flint, Mich., R. B. Shaw of Allegheny Ludlum Steel Corp., George W. Frederick of Republic Steel Corp., O. H. Brunson and George J. Snyder of Ritter Co. Inc. Robert W. Huff of Canton, O., Harold P. Gaw of Armco Steel Corp. and Alexander F. Mack of Thomas Machine Mfg. Co.

Here's one submitted by Arthur M. Scott of New Orleans:

The latitude of the moon on a certain Monday at noon was 1° 53' 18.9", at midnight 2° 27' 8.6"; on Tuesday at noon 2° 58' 55.2", at midnight 3° 28' 5.8"; on Wednesday at noon 3° 54' 8.8". What was the moon's latitude at 9 p.m. on Monday?

Shrdlu

(Metalworking Outlook—Page 43)



Deep-drawing with

FEWER DRAWS

A 10-DRAW CIVILIAN JOB

CUT TO 3 DRAWS

AN 8-DRAW DEFENSE JOB

CUT TO 4 DRAWS

Towle does BOTH on MULTIPRESS®

Multipress does it again—this time on deep drawing operations. In addition to smooth, oil-hydraulic pressure control that gets the most out of every job potential, it offers quick, easy convertibility that meets changing production needs in a hurry!

The deep-drawn tubes shown above, which are later formed into five sterling silver napkin rings, are produced on this 35-ton Multipress at the Towle Manufacturing Company of Newburyport, Mass. Starting with a flat, 7¼" disc, the first draw produces a cup-like shape. The second draw deepens and narrows the cup, and the third produces a 1¾" tube 7" long.

In only three draws, Multipress forms a tube that took ten draws by the old method!

Converted to defense work, the same Multipress forms special tubes used in rocket tail-fin assemblies. Instead of the eight draws formerly needed, Multipress does it in four! Dimensions of the tail-fin units must be held to very close tolerances, as they are used in high-precision assemblies. An aluminum disc 4⅞" in diameter is drawn to round tubing 1⅛" across the bottom, 3⅛" deep, and flared to 2⅜" across the top. Production rate is 7200 units per 8-hour day—with scrap losses held to a negligible factor.

Another Multipress at Towle paid for itself in three months by reducing several eight- and ten-draw jobs to only three or four draws—with better results and less scrap.

In still another case, when all five parts of a silver candlestick were preformed on Multipress, savings in a single year equalled the cost of the press.

The Multipress combination of *widely adjustable action* and *smooth pressure control* has proved to be the best answer to an amazing range of production jobs, including drawing, forming, flaring, stamping, crimping, staking, assembling, punching, slotting, blanking, broaching, trimming—and so on. Eight Multipress frame sizes offer capacities from one to 50 tons. Write for full details today!

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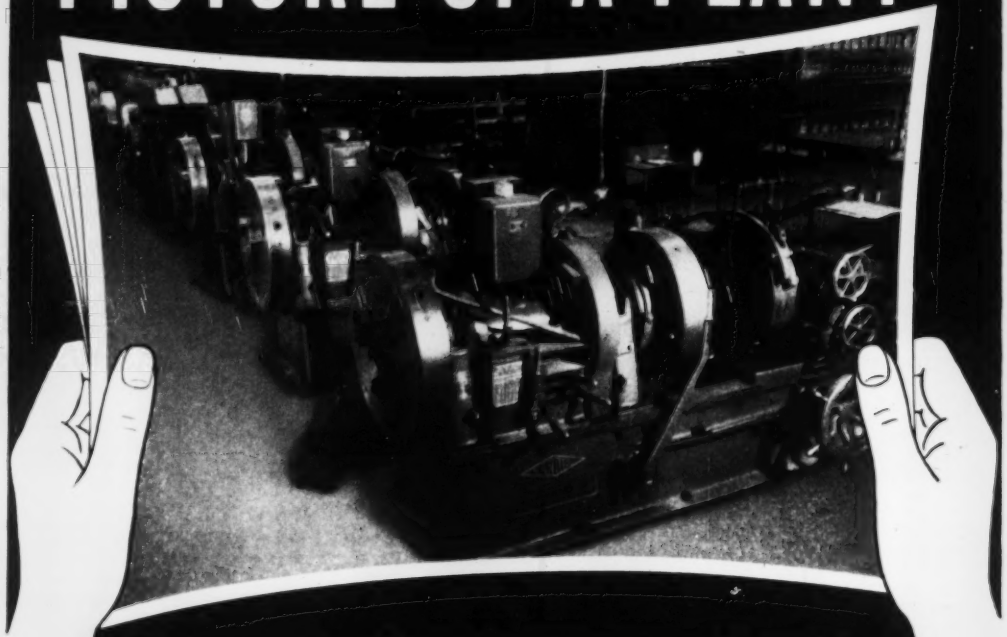
PICTURE OF A PLANT—



Equipped for ANY Pipe Threading Operation!

An installation of eight LANDIS Pipe Threading Machines is shown at Jarcho Brothers' plant in Long Island City. These machines, ranging from 2" to 12" in size, thread, ream, bevel, and cut off pipe varying from $\frac{1}{2}$" to 12" in diameter.

LANDIS Pipe Machines are built for heavy-duty service in continuous production. Quality threads and close concentricity is guaranteed by the sleight floating action of the die head in the T-slot of the crossrail, and by the adjustable grip feature which assures correct alignment of the work in the chucks.

Tool inventories are relatively small since the LANDIS Chasers used will thread all diameters within the range of the die head having the same form, pitch, and taper. These chasers also reduce tool replacement cost for they can be reground and used for most of their length, and can be replaced individually as needed.

LANDIS

LANDIS *Machine* COMPANY • WAYNESBORO PENNSYLVANIA

THE WORLD'S LARGEST EXCLUSIVE MANUFACTURERS OF THREAD GENERATING EQUIPMENT

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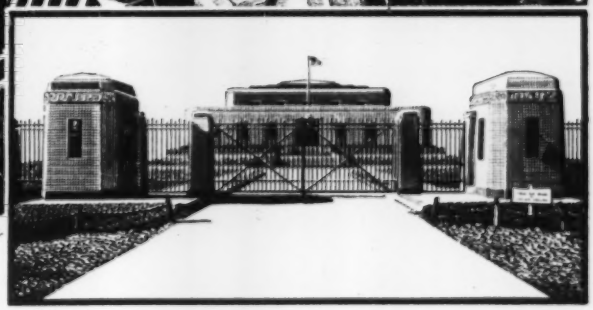

Gold Depository in Fort Knox, Kentucky

. . . more important than gold!

The most important metal today is not the tons of gold buried at Ft. Knox!

Far more important are the millions of tons of iron and steel scrap so desperately needed to make new steel. All scrap, actual and potential, needs to be gathered up and channeled to the steel producing plants-NOW, today, tomorrow and tomorrow. So long as the steel industry is called upon to produce two million and more tons of ingot steel per week, it must have one million and more tons of scrap each week.

Steel producers are getting the iron ore, limestone and coal they need. But the scrap situation is critical and will continue to be so until inventories are built up substantially.

As a user of steel--as one interested in seeing that America's rearmament program is not too little and too late--you can do your part to see that your community and your business keep scrap moving toward the mills.

YOUR SCRAP YOUNGSTOWN IS NEEDED

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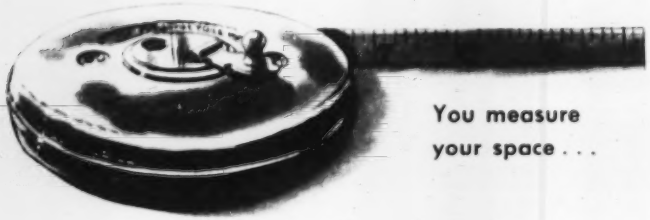
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment!

NEW! NOW!

SIX PRE-PACKAGED FIRE EXTINGUISHING SYSTEMS TO FIT YOUR SPECIFIC NEEDS!



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anybody who can cut pipe can install them

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NEW EQUIPMENT DIGEST

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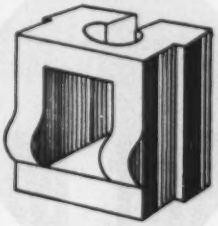
You can't take a chance with a BREECH RING

. . . NOT WHEN THE FORGING COSTS $1100.00!

LAPOINTE



BROACHING eliminates the worry and the risk of spoilage, in machining this heavy Breech Ring . . . and does it with relatively unskilled men! Close tolerances and fine finish are automatically obtained with this LAPOINTE two-machine setup, which has proved to be so successful with Arsenals and sub-contractors on 90 mm guns. Production speed is impressive, too: **one completely broached part every 50 minutes!**

Send today for our special bulletin on horizontal broaching machines. Ask for HP-3.

50 YEARS IN BROACHING
We're the oldest in the world!
1902 • GOLDEN ANNIVERSARY • 1952

LAPOINTE HP-100 HORIZONTAL BROACHING MACHINE 50 TON, 72-INCH STROKE. Hydraulically operated shuttle type fixture, with hydraulic clamping cylinders. Completely automatic hydraulically operated horizontal turrets eliminate all manual handling of the heavy broaches.

THE LAPOINTE MACHINE TOOL COMPANY
HUDSON, MASSACHUSETTS • U. S. A.
Branch Factory: Watford, Herts., England

HUDSON LAPOINTE MASS.

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

HEAVIER CUTS IN HARDER MATERIALS AT HIGHER SPEEDS

Get More Production with GORHAM "M-40-B" Tool Bits!

Get more out of your machine tools . . . raise your production curve . . . with Gorham "M-40-B" turning tools! Use "M-40-B" wherever the application of a Super High Speed Steel is indicated, as in machining heat treated alloy steels with large amounts of stock removal at high surface speeds.

"M-40-B" is a Super Moly grade with performance characteristics comparable to those of super tungsten high speed steel. It has extremely high red hardness, high Rockwell hardness, and offers maximum toughness and abrasion resistance. You can take heavy roughing cuts with it at high surface speeds and feeds . . . use it for high speed finish cuts as well.

"M-40-B" comes in square tool bits, 11 stock sizes, and in 23 stock sizes of rectangular turning tools. Bits and turning tools are accurately ground, uniformly hardened, ready to sharpen. Special sizes and shapes to your order. Illustrated with prices are three popular size "M-40-B" tool bits. See your distributor, or send direct for a trial order.

"M-40-B" is one of three cutting tool materials developed by Gorham. Others are Gorham "Standard", for the commercial field, and "Gormet", for turning soft or abrasive stock. They're completely described, with size and price lists, in a new free bulletin. Send for your copy today.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

14401 WOODROW WILSON • DETROIT 3, MICHIGAN

WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

LETTERS
TO THE EDITORS

Old Story: Cast Scrap Prices

For some time we have used STEEL's market prices as sort of a guide. However, for the past year or more all we seem to find in your market price section is government ceiling prices on cast iron.

For your information for several months a nearby iron works has been paying $47.00 per gross ton for top grade iron. Another foundry on the east side of the state has been buying all the clean motor blocks it wants at $49.00 per gross ton in Bay City. We are paying $4.00 less than ceiling all down the line and are offered more than we want at those prices.

We believe the market has been shot for some time but you would never know it by reading the STEEL market reports.

Why don't you guys get on the ball?

T. E. Malpass
Partner
East Jordan Iron Works
East Jordan, Mich.

• *STEEL has been reporting the softening in cast scrap prices for some time. For example, it was noted on Jan. 21, p. 119; Jan. 28, p. 113; Feb. 4, p. 200; Feb. 11, p. 168; Feb. 18, p. 189; Feb. 25, p. 153, and in nearly every issue thereafter. Scrap report in the Apr. 7 issue states in part "Detroit . . . Cast scrap remains a drug on the market. Motor blocks are being bought $5 under ceiling and No. 1 Cupola $2 under ceiling at best."*

A Cover Story

May we have 25 overruns of the cover for the Mar. 31 issue of STEEL?

Robert McNamara
Hill & Knowlton Inc.
Cleveland

Our Treasure Is Exhausted

I read with interest your article "There Is Treasure in Taconite" (Mar. 17, p. 65). Is there any other information available on the proposed operations of the Humboldt Mining Co. in their "Jasper" operation?

J. K. Bole Jr., Assistant Manager
Republic Steel Corp.
Washington

• *We held back nothing.*

Who and Where Department

Your article "Sales for Hire" (Mar. 24, p. 50) mentions the Manufacturers' Agents National Association. Can you give me their address?

E. G. Priebe
Valley Machinery & Supply Co.
Rock Island, Ill.

• *The address is Manufacturers' Agents National Association, P. O. Box 428, 1849 W. Main St., Alhamba, Calif.*

for ease of operation...
economical production

use **Pittsburgh**
COLD HEADING WIRE

You get trouble-free service from your cold heading machines —more economical production with Pittsburgh Wire. It feeds smoothly into your dies because of its uniform size. It forms readily in upsetting, extruding, thread rolling, bending and flattening operations because it has the ductility and the correct lubricant you need for high quality production in your particular operation.

The precision control of quality at Pittsburgh Steel gives you sound wire, with the toughness you want in your finished product. The economy of Pittsburgh Wire will be reflected in both your production records and the quality of the items you produce. Specify Pittsburgh Steel Wire for all your cold heading and cold forming operations. For information write Pittsburgh Steel Company, Dept. S, Grant Bldg., Pittsburgh 30, Pa.

Pittsburgh Wire

A product of **PITTSBURGH STEEL COMPANY**

MOVE up to 75,000 lb. COILS...

with less scrap, greater safety

Yield goes up... waste goes down... with LINK-BELT Coil Handling Equipment

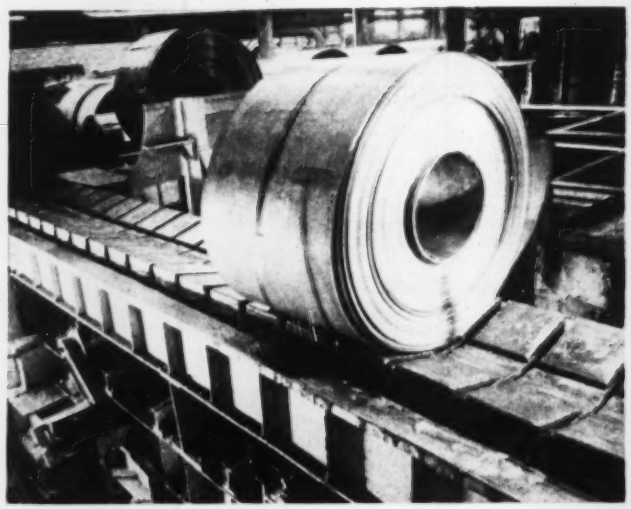
THE giant coils now handled in steel mills necessitate modern conveying equipment. Link-Belt has kept pace with new techniques, and today steel mills can move 75,000-pound pickled coils more easily than they once handled coils a fraction of that weight. From hot mill to shipping platform, three basic types of Link-Belt conveyors provide safe, economical transportation.

Link-Belt conveying systems eliminate hours of lost time. Coils travel close together, eliminating bottle-necks. They're handled gently, preventing edge damage. Down-time is reduced.

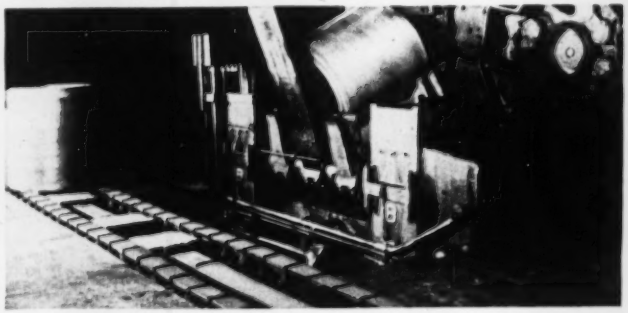
The physical work of crews is reduced. Link-Belt auxiliary devices transfer coils from one conveyor to another, turning, lowering, tilting, and weighing them with ease and precision. This increased mechanization means greater safety for workers.

It pays to call in Link-Belt while expansion is still in the planning stage. The Link-Belt engineer, working hand-in-hand with your own engineers, consultants and builders of mill and process equipment, can help you solve your mechanization problems.

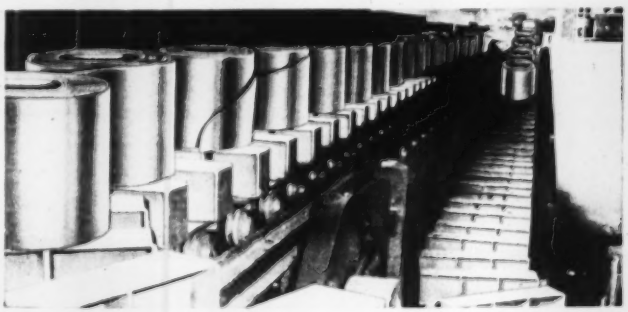
For a conveyor system planned to your specific requirements, contact your nearest Link-Belt representative.



Link-Belt V-top, 36-inch-wide heavy duty pallet conveyor at delivery end of continuous pickle line ahead of cold rolling mill, carrying 15-ton coils. Coils are carried on their sides without damage.



Link-Belt double-strand roller chain conveyor carries 76-inch coils from hot-strip coiler. Down-tilter lowers coil to Waffle-Top Loader. Other Link-Belt equipment transfers coils gently from one conveyor to another.



Where numerous turns are required or cooling space is limited, Link-Belt Car-Type Conveyors are best. Coil never leaves its car. Without rolling or scuffing of edges, coils go around corners, up and down inclines.

LINK-BELT

MATERIALS HANDLING, PROCESSING & POWER TRANSMISSION MACHINERY

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Cleveland 13, Pittsburgh 13, Atlanta, Dallas 1, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices in principal cities. 0 459

8000 reasons why Goldens' like the Warner & Swasey 1-AC

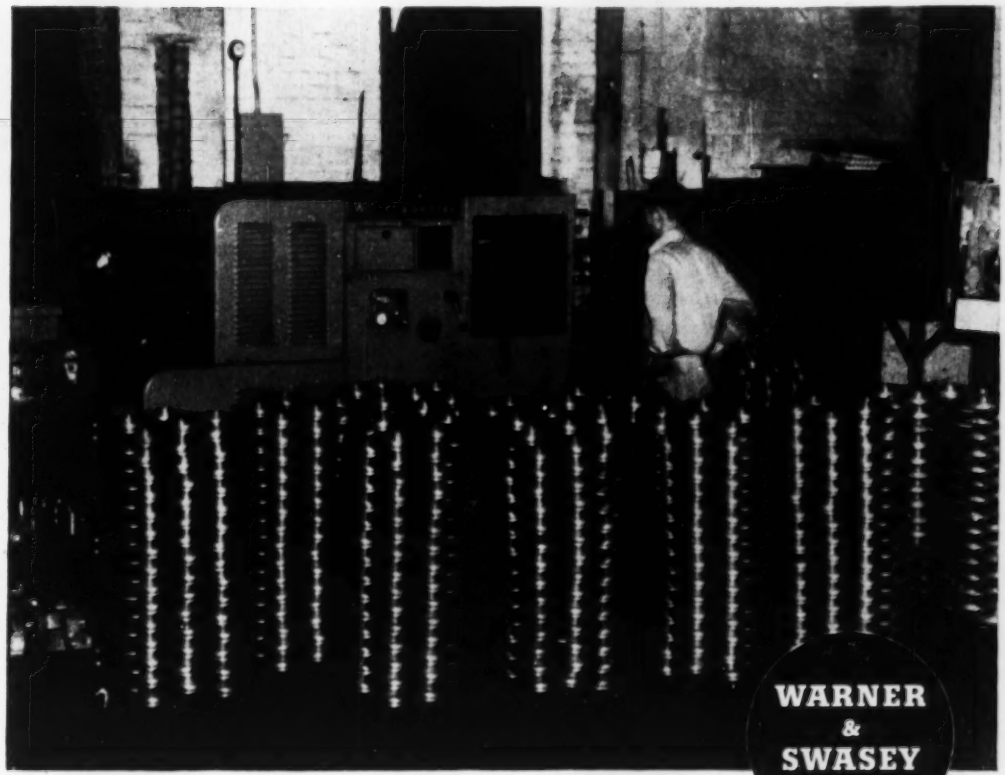
● The pulleys shown in the picture, part of an 8000-lot run, might not have been possible at Goldens' Foundry & Machine Company of Columbus, Georgia, if it had not been for their new Warner & Swasey 1-AC Single Spindle Automatic.

Bought originally to produce parts in quantities of 100 to 700, the 1-AC did that job well . . . far surpassed production over previous hand-operated methods, and with accuracy of six ten-thousandths of an inch in the bore.

It was then that a bid on an 8000-piece pulley job was being let. This was a high priority job requiring quick delivery. Goldens' was low-bidder and, with the 1-AC, were able to meet the delivery date—both of which would have been impossible with their previous hand-operated equipment.

The 1-AC is opening up profitable new fields for this company—paying itself off fast.

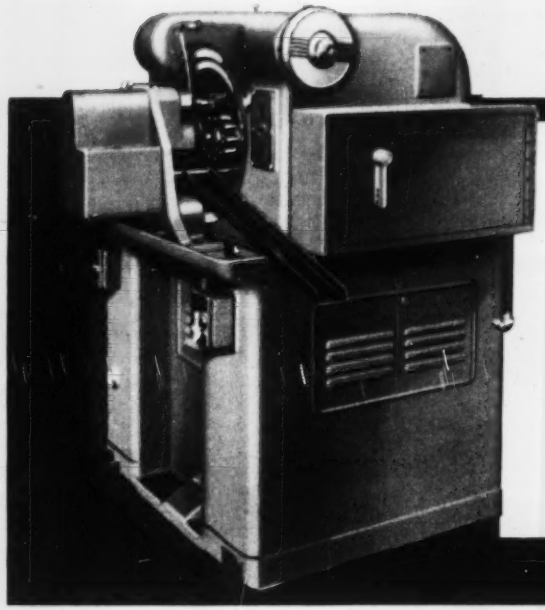
Project the possibilities of the 1-AC into your own plant, your own market. Your Warner & Swasey Representative will be glad to help.



YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

FOR SMOOTH THREADS...*FAST!*

you'll save materials ...and manpower



with the

NAMCO TRIPLE ROLL HYDRAULIC THREAD and FORM ROLLING MACHINE

with Magazine Feed and Hydraulic Loader

This precision high-production machine is the perfect answer for makers of instrument, aeroplane or automotive dry-seal parts for the defense program. Thread lengths greater than twice the diameter can be produced smoother, faster—and with a greater saving in materials and man-hours than by any other method.

The Namco Thread-Roller operates on either the plunge-cut or the feed-through principle, with interchangeable two-roll or three-roll heads and straightline support. Class 3 fit and unsurpassed finish (superior to ground-thread production) are characteristic.

Capacities range from $\frac{3}{8}$" up to $1\frac{1}{2}$" using three rolls—and $\frac{1}{4}$" to $\frac{3}{8}$" using two rolls. Because of its three-roll operation and three-point support, which eliminates distortion, the machine is a "natural" for hollow work.

To save additional man-hours and permit the use of unskilled labor, magazine feed and hydraulic loader are available. This combination makes the Namco Thread-Roller the fastest, most versatile, most accurate, *most economical* means of thread production available today. Send us samples of the jobs you want to do; we'll do the rest—in quoting you on your requirements.

Ask us for your copy of this twelve page bulletin (TR 49) giving complete details on the Namco Thread-Roller.

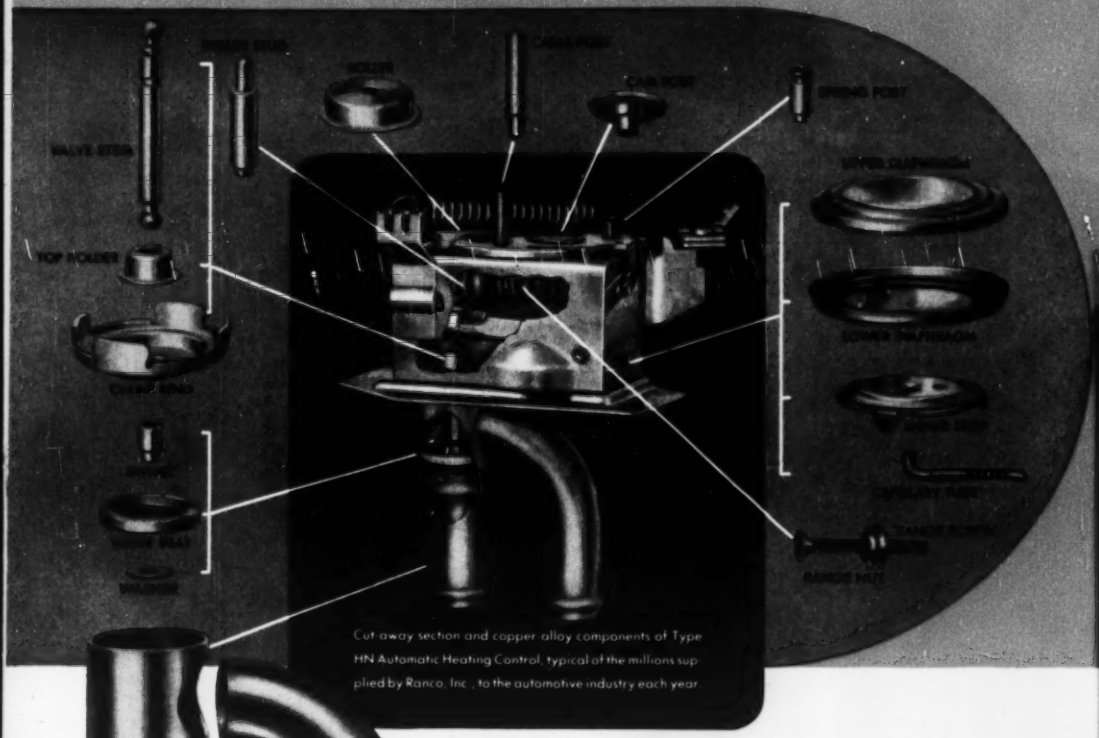
The NATIONAL ACME CO.

170 EAST 131st STREET • CLEVELAND 8, OHIO

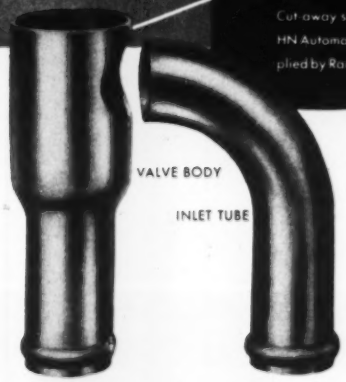
Acme-Gridley Bar and Chucking Automatics: 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • The Chronolog-Limit, Motor Starter and Control Station Switches • Solenoids Centrifuges • Contract Manufacturing

COPPER and BRASS for lasting dependabilty

42,000,000 Ranco Controls *prove it!*



Cut-away section and copper alloy components of Type HN Automatic Heating Control, typical of the millions supplied by Ranco, Inc., to the automotive industry each year.



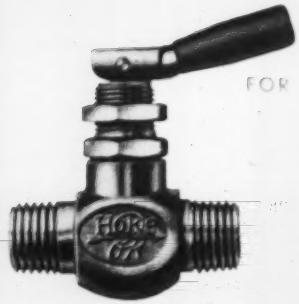
For twenty-four years, Ranco, Inc., Columbus, Ohio . . . world's largest manufacturer of refrigeration and automobile heater controls, has made extensive use of Anaconda Copper, Brass and Bronze to build lasting dependability into its top-quality, low-cost units.

In fabricating these parts, nothing takes the place of copper and its alloys for machining, forming, soldering and brazing. In this type of service, no other materials offer the combined advantage of high corrosion resistance, freedom from rust and high heat-transfer properties.

Anaconda Metals, unsurpassed by any in the industry, are made by The American Brass Company, General Offices, Waterbury 20, Connecticut.

ANACONDA

COPPER and COPPER ALLOYS



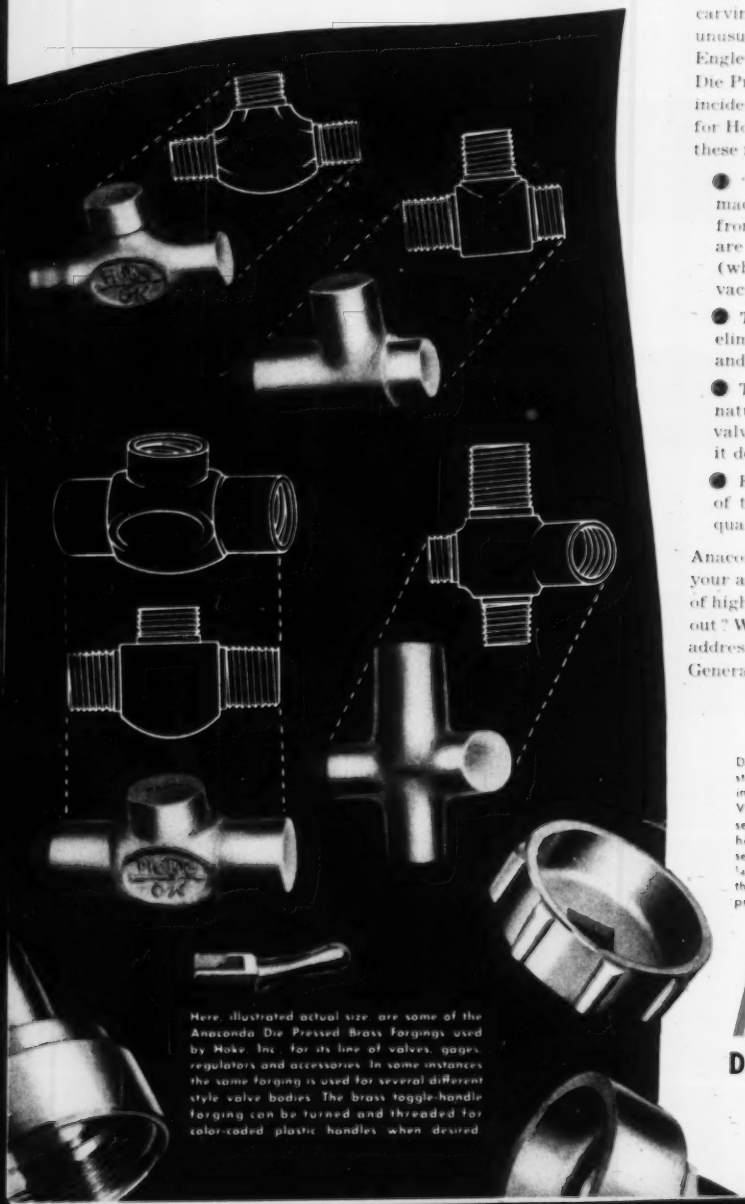
FOR TOGGLE VALVES LIKE THIS

Die Pressed Forgings give Hoke, Inc., **plenty to talk about . . .**

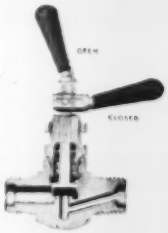
If you've been using sand castings, or carving away a lot of metal to arrive at an unusual shape, listen to what Hoke, Inc., of Englewood, N. J. has to say about Anaconda Die Pressed Forgings. And this enthusiasm, incidentally, is tempered with experience, for Hoke has used hundreds of thousands of these forgings a year—for many years.

- "These forgings are solid, readily machined and dense-grained metal. Made from sections of extruded brass rod, they are 'twice wrought' and *free of porosity* (which is even more important in high vacuum than in high pressure service).
- Their die-like dimensional accuracy eliminates filing and fussing to fit jigs and fixtures.
- The surface of these valve bodies is naturally smooth and gives the finished valve that 'precision product' appearance it deserves.
- Economy? Yes indeed! We sell some of these solid brass Hoke Valves, in quantity, for less than a dollar apiece!"

Anaconda Die Pressed Forgings may be your answer to that elusive combination of high quality and low cost. Why not find out? Write for a copy of Publication B-9 addressing The American Brass Company, General Offices, Waterbury 20, Connecticut.



Here, illustrated actual size, are some of the Anaconda Die Pressed Brass Forgings used by Hoke, Inc. for its line of valves, gages, regulators and accessories. In some instances the same forging is used for several different style valve bodies. The brass toggle-handle forging can be turned and threaded for color-coded plastic handles when desired.



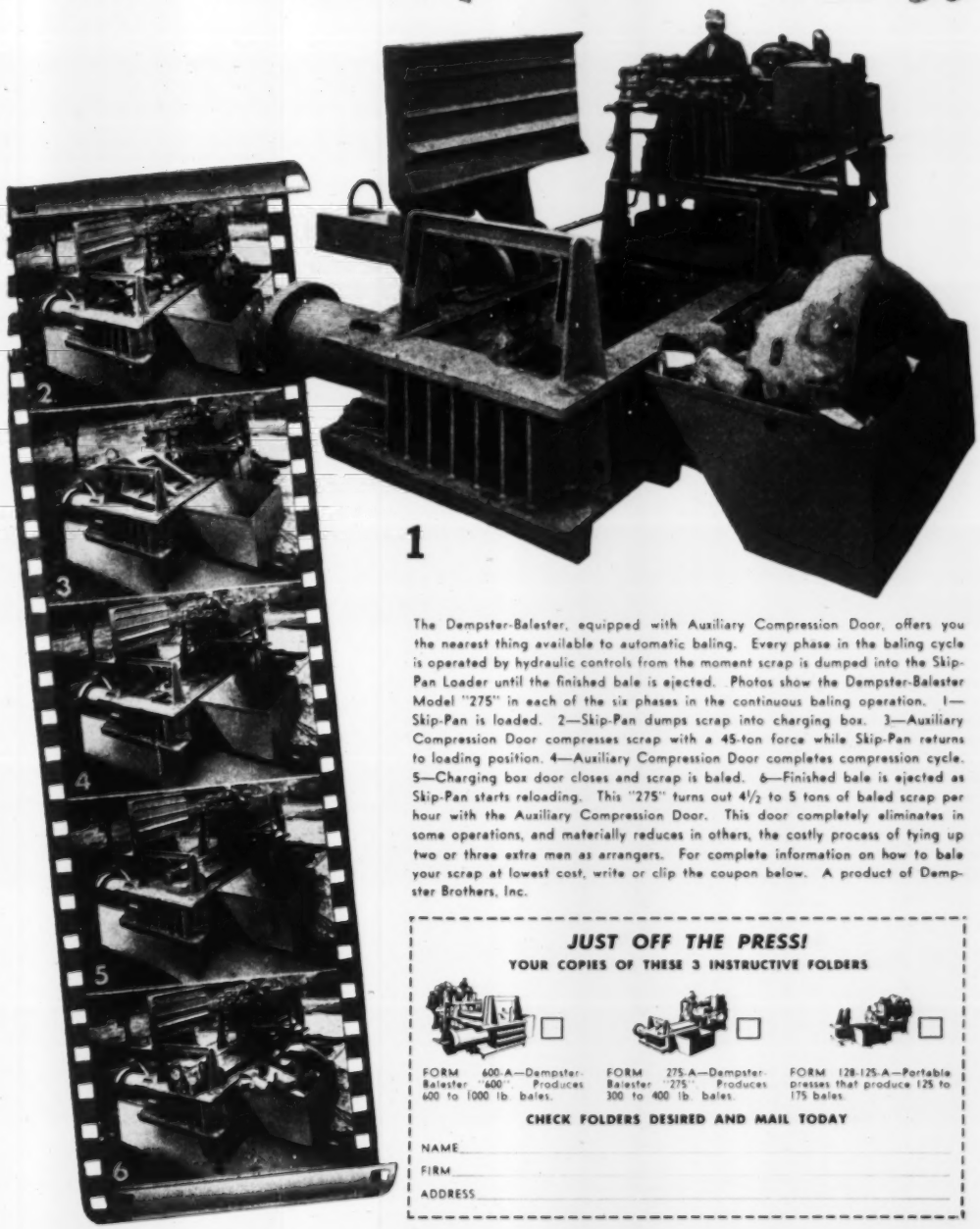
Designed for either pipeline installation or panelboard mounting, the Hoke "On-Off" Toggle Valve can be used in series with sensitive throttle valves, and for high pressure or high vacuum service. Made of brass in ⅛", ¼" and ⅜" sizes, they have been the answer to many flow-control problems.

DEPEND ON TWICE-WROUGHT

ANACONDA

DIE PRESSED FORGINGS

here's the nearest thing to Automatic Baling!



The Dempster-Balester, equipped with Auxiliary Compression Door, offers you the nearest thing available to automatic baling. Every phase in the baling cycle is operated by hydraulic controls from the moment scrap is dumped into the Skip-Pan Loader until the finished bale is ejected. Photos show the Dempster-Balester Model "275" in each of the six phases in the continuous baling operation. 1—Skip-Pan is loaded. 2—Skip-Pan dumps scrap into charging box. 3—Auxiliary Compression Door compresses scrap with a 45-ton force while Skip-Pan returns to loading position. 4—Auxiliary Compression Door completes compression cycle. 5—Charging box door closes and scrap is baled. 6—Finished bale is ejected as Skip-Pan starts reloading. This "275" turns out 4½ to 5 tons of baled scrap per hour with the Auxiliary Compression Door. This door completely eliminates in some operations, and materially reduces in others, the costly process of tying up two or three extra men as arrangers. For complete information on how to bale your scrap at lowest cost, write or clip the coupon below. A product of Dempster Brothers, Inc.

JUST OFF THE PRESS!

YOUR COPIES OF THESE 3 INSTRUCTIVE FOLDERS

☐ FORM 600-A—Dempster-Balester "600". Produces 600 to 1000 lb. bales.

☐ FORM 275-A—Dempster-Balester "275". Produces 300 to 400 lb. bales.

☐ FORM 128-125-A—Portable presses that produce 125 to 175 bales.

CHECK FOLDERS DESIRED AND MAIL TODAY

NAME_____

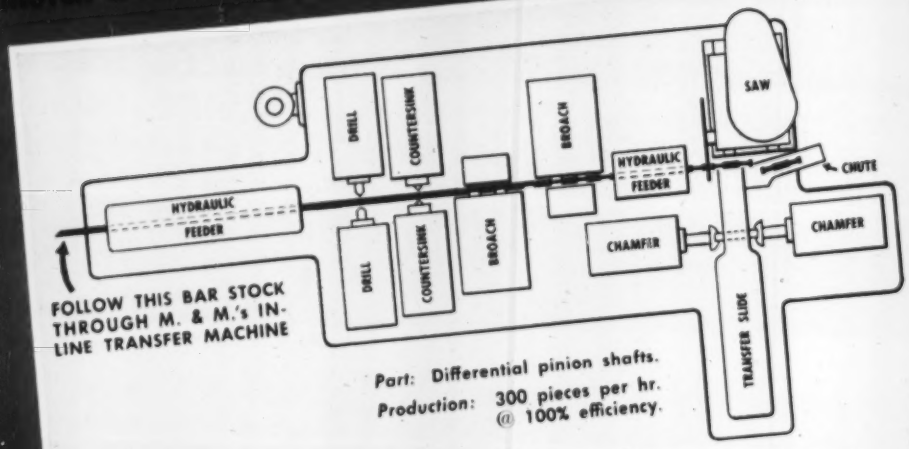
FIRM_____

ADDRESS_____

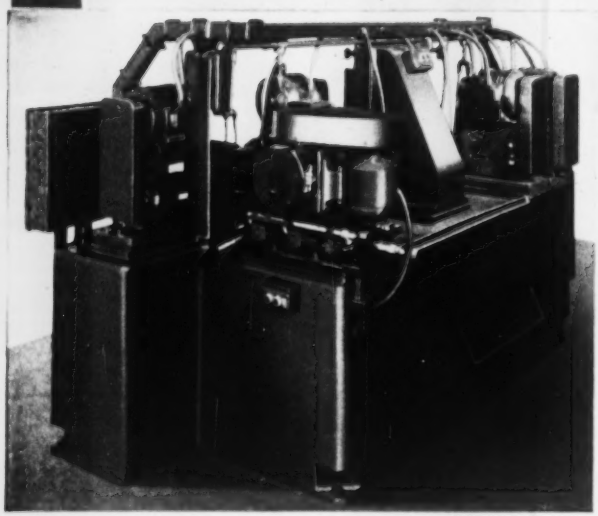
DEMPSTER BROTHERS, 642 Dempster Bldg., Knoxville 17, Tennessee

Combine Operations

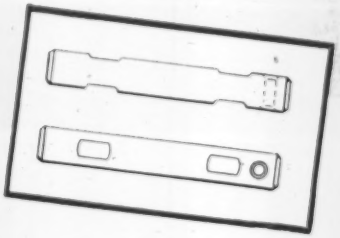
MOTCH & MERRYWEATHER Automatic IN-LINE Transfer Machine



Part: Differential pinion shafts.
Production: 300 pieces per hr. @ 100% efficiency.



Save time and floor space by combining operations.



● Many machining operations are combined on an M. & M. progressive IN-LINE automatic transfer machine. Stock is held *motionless*. Most of the operations are performed on a length of solid bar stock prior to cutting off. Using the progressive in-line principle, we can design a production machine for your individual requirements. Odd-shaped extrusions present no machining problem.

Send us your parts drawings.

Manufactured by

THE MOTCH & MERRYWEATHER MACHINERY COMPANY
715 PENTON BUILDING • CLEVELAND 13, OHIO
Builders of Circular Sawing Equipment, Production Milling, Automatic and Special Machines

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT

OBTAINED: information that helps you find hidden plant capacity!

Ordinary lighter flints hold the secret

For years industry had sought a way to broaden the use and capacity to produce many strategic corrosion and high heat resistant steels, by imptoving their hot workability. Carpenter **A·E·Service** hit the secret . . . applied Cerium, a rare-earth element heretofore used chiefly in ordinary cigarette lighter flints.

Making a "nickel" work easier

"Working" of machining 36% nickel alloy parts used to be a pain in the neck to industry. Then **A·E·Service** went to work for Carpenter customers. Result: Free-Cut Invar "36" was invented. Now 36% nickel alloy parts are machined faster, easier, and many new uses are now possible.

There's a reason why many plants are finding hidden plant capacity to meet higher production quotas these days. They're getting *more* from present machinery and manpower, because of Carpenter's **A**pplication **E**ngineering **S**ervice.

A·E·Service is Carpenter's way of working with customers to get maximum returns from every job involving specialty steels. That's why it's a revelation to watch the Carpenter man at work. He digs for every bit of data he can get. He analyzes the job, notes previous performance records, asks a lot of questions. Result: He's equipped to intelligently recommend the one steel best fitted for top performance.

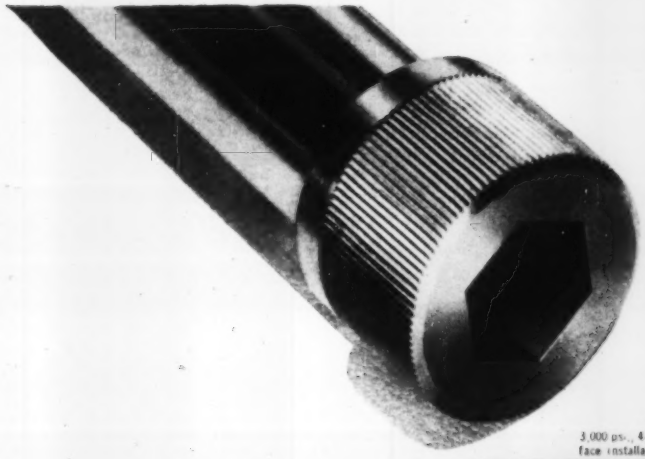
And **A·E·S**ervice is more. It involves in-the-shop counsel by field engineers to spotlight opportunities for more output. When necessary, it puts a pioneering staff of laboratory technicians on the job. In answer to customers' needs, this is the same staff that invented the first free-machining stainless, the first low temperature air-hardening die steel, the first chrome-nickel alloy steel of its kind in the world.

This is Carpenter **A·E·S**ervice . . . an entirely different concept of service on specialty steels. You can count on it now and in the days ahead.

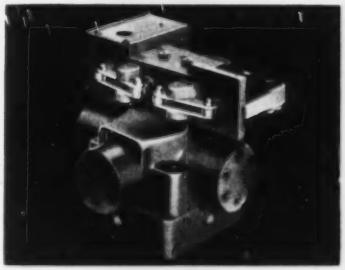
keeps you ahead of competition

THE CARPENTER STEEL COMPANY • READING, PA.

Pioneers in improved Tool, Alloy and Stainless Steels through continuing research



3,000 psi., 4-way valve illustrating flush surface installation of UNBRAKO Cap Screws.



UNBRAKO CAP SCREWS

PRECISION FINISH ADDS SALES APPEAL TO YOUR PRODUCT

Every spring, washer, nut and bolt is equally important to your product, but it's the finish that attracts attention, arouses interest, and creates a desire for it.

SPS makes its products to help you sell your products. Our threaded industrial fasteners—UNBRAKO Socket Screw Products—have the clean precision finish to give your product added eye appeal; the uniform accuracy and strength to give it added sales appeal.

Take advantage of SPS Fastener Engineering. Let the experience and know-how of more than 40 years help you sell your product. STANDARD PRESSED STEEL CO., Jenkintown 33, Pennsylvania.

UNBRAKO
SOCKET SCREW
DIVISION

SPS
JENKINTOWN PENNSYLVANIA

CAP SCREWS • SET SCREWS • SHOULDER SCREWS • DOWEL PINS • PRESSURE PLUGS

High Production

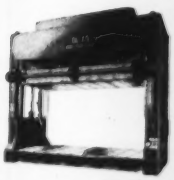
Toggle Drawing

Coining and Embossing

Hobbing

FROM THE RIGHT PRESS FOR A GIVEN JOB TO A COMPLETE PRESS ROOM... *It's Bliss!*

Double Crank



Die Spotter

There can be only one *right* press for a given job. When all factors are weighed: cost...quality of stampings...maintenance...adaptability—one will emerge as the *right* press.

It's logical to call on Bliss for press recommendations because:

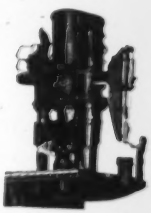
Bliss builds more types of presses—mechanical and hydraulic—than any other company in the world.

Bliss builds the full range of automatic feeding, indexing and ejecting devices to obtain the maximum press output.

Bliss has the engineering experience—over 90 years of it—in designing equipment for the forming, drawing and extrusion of steel, copper and brass...for light and powdered metals.

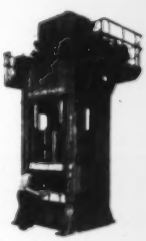
Whether it's a single press for a given job or a complete stamping plant, Bliss engineers welcome your inquiry. They will help you on methods, production rates and costs without obligation.

Single Crank



Heading

Inclinable



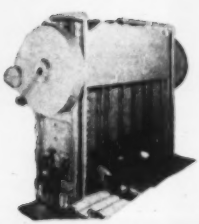
Double-action Hydraulic

E. W. BLISS COMPANY, CANTON, OHIO

E. W. Bliss Company (England) Ltd., Derby, England

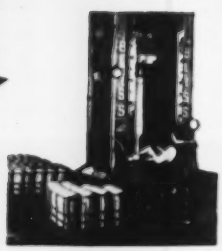
E. W. Bliss Company (Paris), St. Ouen sur Seine, France

Presses, Rolling Mills, Special Machinery



Rail Forming

Hydraulic Open Rod



Hydraulic Redraw

BLISS ON YOUR PRESS IS MORE THAN A NAME...IT'S A GUARANTEE

If you want to get the True Picture of what Rotary Slitting Can Be . . .

then get **SIMONDS**

"Red Streak" Forged Rotary Shears

For shearing cold sheet or strip . . . separately or in gang-slitting operations . . . these "Red Streak" Rotary Shear Knives do the job *as nothing else can do it.*

Forged from Simonds special Shear Steel . . . poured in Simonds' own steel mill . . . you can get "Red Streak" Shears in these 3 different alloys, each formulated for a specific application:

High-chrome steel, for shearing hot and cold rolled, tin plate and non-ferrous . . . *High-speed steel,* for hot and cold rolled . . . and *Special-alloy steel,* for hot and cold rolled and non-ferrous. Whatever your shearing job, Simonds has the knife that will stand up longer, cut cleaner, and at lower cost. Get in touch with your Industrial Supply Distributor *now.*

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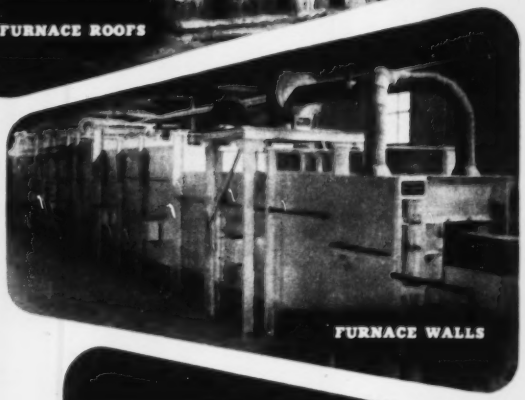
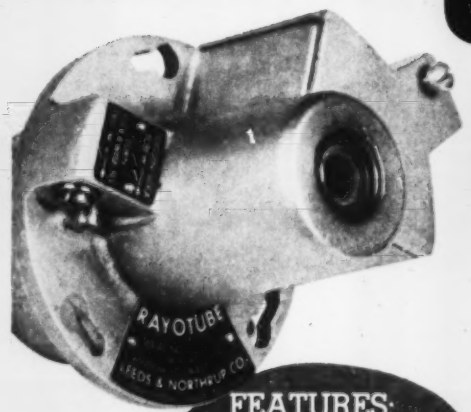
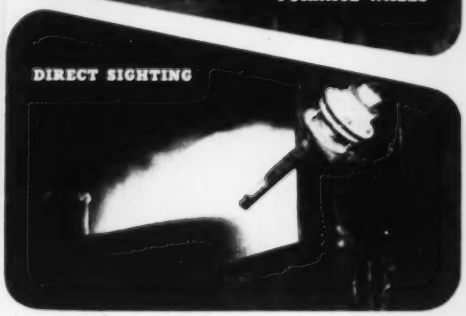
This RAYOTUBE suits all locations COOL OR HOT

FURNACE ROOFS


FURNACE WALLS




DIRECT SIGHTING

FEATURES:
Quick installation
" sighting
" response to temperature

Here is the radiation-sensing unit for 9 out of every ten radiation-pyrometer uses. It adds the storekeeping advantages of smaller instrument inventory to the operating advantages* of all Rayotubes. Many hundreds of this type are now in use. Among its features:

1. Easy to install because it needs no water-jacket unless the head housing itself (shown above) reaches interior temperature of 350 F. Even then, no harm is done below 450; accuracy decreases above 350, but returns fully as temperature drops. In practical operation, even 350 is reached on very, very few installations.

When replacing a present jacketed Rayotube with this type, it is not necessary to tear out the jacket and piping. Simply insert Rayotube in jacket and turn off water if no longer needed.

2. New, quick-sighting optical system shows exact area from which temperature is being recorded. This is especially helpful when instrument is being positioned to point down an open-end tube and measure directly the surface temperature of parts being heated.

3. Can be used with Speedomax electronic instruments as well as with Micromax equipment—which blanket every temperature-recording and/or controlling job in industry.

This Rayotube is No. 8890. Any L&N office, or headquarters at 4957 Stenton Ave., Phila. 44, Pa., will send details on request.

LEEDS & NORTHRUP

MEASURING INSTRUMENTS · AUTOMATIC CONTROLS · TELEMETERS
HEAT-TREATING FURNACES

Jrl. Ad NS3(3)

*Any L&N man can give details

DoALL PRODUCTION NEWS

Vol. 1 Published by The DoALL Company, 254 N. Laurel Ave., Des Plaines, Illinois No. 4

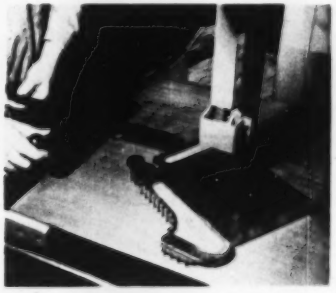
QUALITY CONTROL OF DoALL SAW BANDS MAKES POSSIBLE UNQUALIFIED GUARANTEE

Heavy Band Sawing Made Easier With New Ratchet Feed

Attachment Reduces Operator Fatigue, Assures Maximum Band Life and Cutting Rate

A new hand-operated ratchet feed attachment that makes heavy band sawing easier is now available for any DoALL Band Machine. The feed can be used for either straight or contour sawing. It has a movable rack and lever-operated pinion with a mechanical advantage of approximately 9 to 1.

Use of the attachment permits continuous, controlled feed pressure, and consequent maximum cutting rate, without operator fatigue. At the same time, the sensitivity of the unit allows the



operator to "feel" the cutting action so that he does not exert excessive feed pressure which would overload the saw band.

This inexpensive aid to faster and more efficient band sawing is applicable to the majority of sawing jobs requiring a medium feed pressure. A demonstration of the unit will be made in any plant upon request.

83 Inspections Insure Users Maximum Blade Life and Cutting Efficiency

Users of DoALL saw bands on any make of horizontal or vertical band sawing machine are protected by the following guarantee:

"If any DoALL saw band fails to perform satisfactorily because of faulty steel, heat treating, dimension, set or tooth structure it will be replaced at no charge to the customer."

This quality guarantee is all-inclusive because it itemizes every physical component of a saw band. Even more important than the replacement of the blade itself is the assurance behind this guarantee that production efficiency is not apt to suffer due to poor saw band quality.

Samples are taken from every coil of raw steel for exhaustive inspection.

Saw Band Inspections

No manufacturer can afford an unqualified guarantee of quality without having an inspection system that insures a product as perfect as it is humanly possible to make.

Inspection of DoALL saw bands starts with a sample snipped from every coil of raw steel received. This steel is put through exhaustive examinations for thickness, width, camber, wedge, lip, edge roughness, edge radius, hardness, weldability, cracks, brittleness and carbide size and distribution. Failure to meet any single inspection means that the steel is returned to the mill to be sold for some less exacting use.

Microscopic examination of hardened saw band teeth.

At every stage in the manufacturing process, DoALL saw bands are subjected to further examination — after "toothing", setting, hardening, annealing; even after packaging. Tooth formation, dimension, set, hardness after heat treating—these and many more critical factors must meet what are believed to be the most exacting tolerances ever established in saw band manufacture.

* * * *

There are 32 DoALL Sales-Service Stores in the United States, two in Canada and one in Mexico, equipped to conduct free demonstrations of DoALL products in any plant upon request.

----- See Next Page -->>

You check the finest watch by the light from a star...

BUT... what Constant you use to check your precision measuring instruments?

with DoALL BLOCKS and accessories you can measure them with accuracy based on the WAVELENGTH OF LIGHT...

DoALL BLOCKS are available in sets ranging from six pieces to 118 pieces.

DoALL Four-range Electric Comparator Gage for measuring parts in thousandths or millionths.

New DoALL High Intensity Monolite for measurement with light waves.

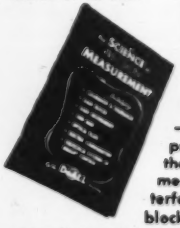
DoALL square and round optical flats for use with a Monolite to "read" sizes, flatness or parallelism in millionths of an inch.

To KNOW if your watch is accurate you refer to a master source of time measurement, the reliability of which is based on the constancy of the heavens. To KNOW that your gages and inspection equipment are accurate you must have some comparable master constant of *linear* measurement.

In DoALL BLOCKS you have that master standard, for they have been held to millionths-of-an-inch accuracies, measured with light wavelengths—a linear constant that never varies under any conditions. And, DoALL will maintain that constant for you through periodic inspection and calibration of your Gage Blocks. DoALL now uses Mercury isotope 198 as a monochromatic light source for measurement of gage blocks.

Use the DoALL "light wave standard" for precision measurement in your plant and you will eliminate an important percentage of the inaccuracies that WASTE man-hours, materials and money. No plant that produces parts in thousandths is too small to need a master measurement control in millionths. There is a DoALL BLOCK set for every requirement. Ask for a FREE DEMONSTRATION in your plant.

THE DoALL COMPANY
254 N. Laurel Avenue • Des Plaines, Illinois



"The Science Of Precision Measurement"
—a new 256 page text book, prepared by DoALL, covering theory and use of equipment for measurement with light wave interference bands; use of gage blocks and accessories; statistical sampling and techniques of Dimensional Quality Control. Price $3.50—call your local DoALL Sales-Service or write to DoALL.

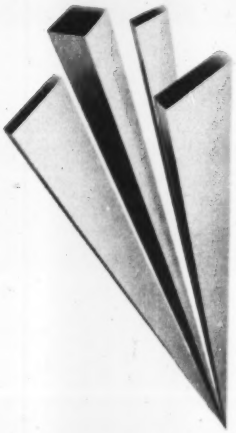
DoALL

Machine Tools . . . Gaging Equipment . . . Tool Steel . . . Band Tools . . . Metal Working Supplies

New Bulletin Describes Cost-Saving Benefits of DoALL Ground Flat Stock

Lists Prices of 238 Sizes Oil Hardening Tool Steel for Tools, Dies, Punches, etc.

DoALL Ground Flat Stock for use in making dies, punches, jigs, fixtures, templates, tools and machine parts is described in a recently-issued 4-page



bulletin. The bulletin explains that the flat stock is ready to use on the layout bench, being accurate to size within very close tolerances and having a finely ground finish. The easy machinability, freedom from decarburization and other surface defects and other advantages are listed.

For quick reference a price list is included covering 238 sizes of Flat Stock from $\frac{1}{64}$" x 1" x 18" to 1½" x 10" x 36". Steel analysis and heat treatment instructions are also given.

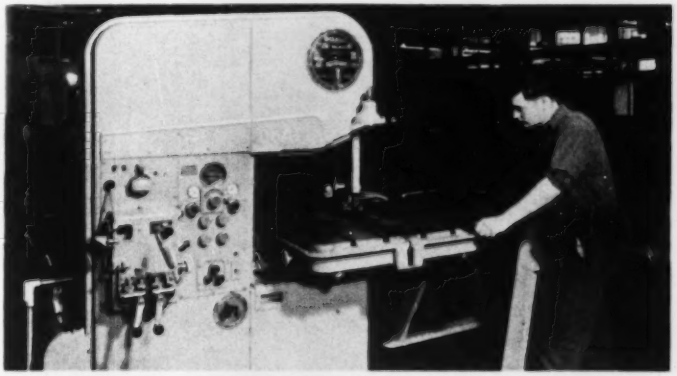
Copies of this bulletin are available upon request.

DoALL Diamond Band Cuts Glass, Rock, etc.

DoALL Diamond Bands, for use with the DoALL MP-20 Contour-matic Band Machine, will cut such materials as bullet-proof glass, geological specimens, hard carbon and other materials with low machinability ratings. The "teeth" are diamond particles imbedded in irregularly spaced matrices which are locked to the steel band. Inquiries are invited.

Friction Band Sawing of 10 Gauge Stainless 15 Times Faster Than Previous Sawing Method

Speed and Versatility of DoAll Contour-matic Band Machine Pays Dividends on Variety of Work at Albany Felt Company

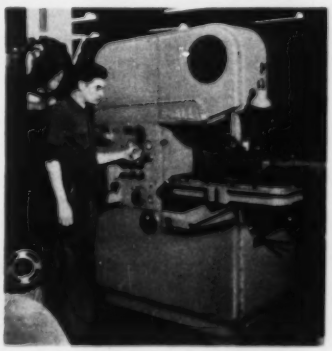


FRICTION SAWING STAINLESS STEEL. 8000 band feet per minute is the operating speed used for friction sawing 10-gauge 18-8 stainless with the DoALL Contour-matic at Albany Felt Company. The new type DoALL Friction Saw Band used has teeth "locked" in place by a special heat treating process.

Albany Felt Company, of Albany, New York, one of the leading manufacturers of paper makers' felts and mechanical woolen goods utilizes the versatility and speed range (40 to 10,000 feet per minute) of a DoALL MP-20 Contour-matic band machine for cutting a wide variety of metal parts as well as woolen goods. The MP-20 was originally purchased to *friction saw* 10 gauge stainless steel used in fabricating of rotary fulling machines and washers for processing industrial woolens. Previously the metal was cut with a reciprocating jig saw attachment on a drill press. Now it is *friction sawed* 15 times faster on the MP-20. Cuts are more accurate and the time required to fabricate the machines has been reduced.

Another time and money-saving benefit to Albany Felt is the ability of the Contour-matic to cut heavy mechanical woolens. This work was formerly sent out of town. Now in their own plant, using a DoALL ¾" double bevel knife band cutting at a speed of 6000 F.P.M., they are able to quickly and accurately cut great thicknesses of woolens. The

CUTTING WOOLENS. A DoALL double bevel knife blade is used on the Contour-matic for cutting heavy industrial woolens at Albany Felt Company. Band speed is 6000 feet per minute for this application.



SAWING STRUCTURAL MEMBERS. Here the Contour-matic is being used for cutting off an I-beam at Albany Felt Company. Other typical parts sawed on the machine are shown at the lower left.

Contour-matic is also used to advantage on various production and maintenance jobs for both cut-off and contour sawing.

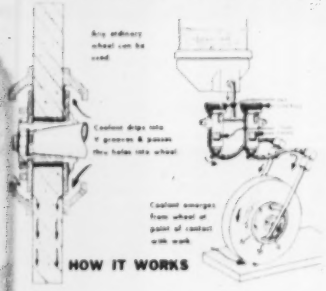
Local DoALL Sales-Service Stores are equipped to demonstrate in any plant, the versatility and the time, money and material-saving advantages of the Contour-matic. Literature is also available on request.

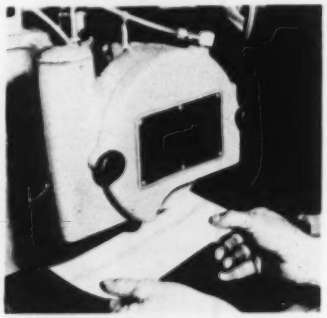
-----See Next Page--→

"Cool-Grinding"* Attachment for DoALL Surface Grinders Speeds Work, Improves Finish

Coolant Flows *Through* The Wheel, Out at Point of Cut; Reduces Temperatures as Much as 400°F

The "Cool-Grinding" attachment for DoALL precision hydraulic surface grinders makes it possible to take the heavy, accurate cuts of which the machines are capable without burning or checking the surface of the work piece. Coolant is metered into a spindle adapter. From here it flows *through* the pores of the wheel and out in a fine mist at point of contact of wheel and work. **Standard grinding wheels are used.**





Blotter held under wheel shows coolant leaves wheel as a fine mist right at point of cutting.

The advantages of this principle of application of coolant are numerous, including:

1. Coolant is applied at the point of cut where the heat is actually generated, a condition not generally attainable with ordinary flood cooling. Tests show that actual cutting temperatures at point of contact are reduced as much as 400°F as opposed to flood cooling. In other words, with "Cool-Grinding" the work is kept cool, whereas with flood cooling the effect is one of high heat at point of contact with an immediate subsequent "quenching" action which can cause warpage, checking and skin softness of the work piece. Users consistently report that heavier cuts can be taken without burning.

2. The work piece is always clearly visible.

3. No objectionable grinding dust is formed.

4. Surface finish of the work piece is smoother.

The advantages of "Cool-Grinding" are so readily apparent when actually demonstrated that nearly every DoALL surface grinder sold today is equipped with a "Cool-Grinding" attachment. Demonstrations will be conducted in any plant upon request.

*Patent No. 2470350

* * * *

NEW DECIMAL EQUIVALENT CHART. Real time saver for making fast calculations—fractions in 1/16ths, 32nd and 64th and their decimal equivalents shown in different columns and colors for easy reading. Available on request.

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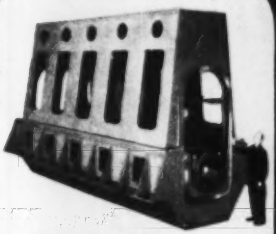
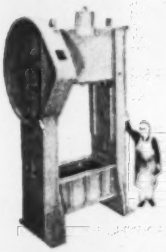
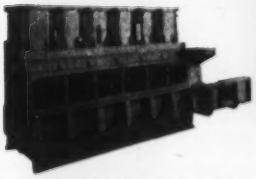
Steel-Weld FABRICATION



Crank Cases, Frames, and other Parts for Manufacturers of Marine Steam Engines of Uniflow or Multiple Expansion Type.

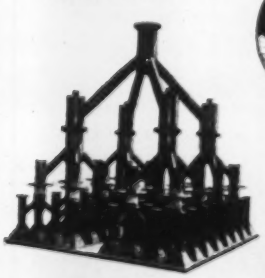


Heavy Press and Machine Frames and Bases for the Machine Tool Industry.

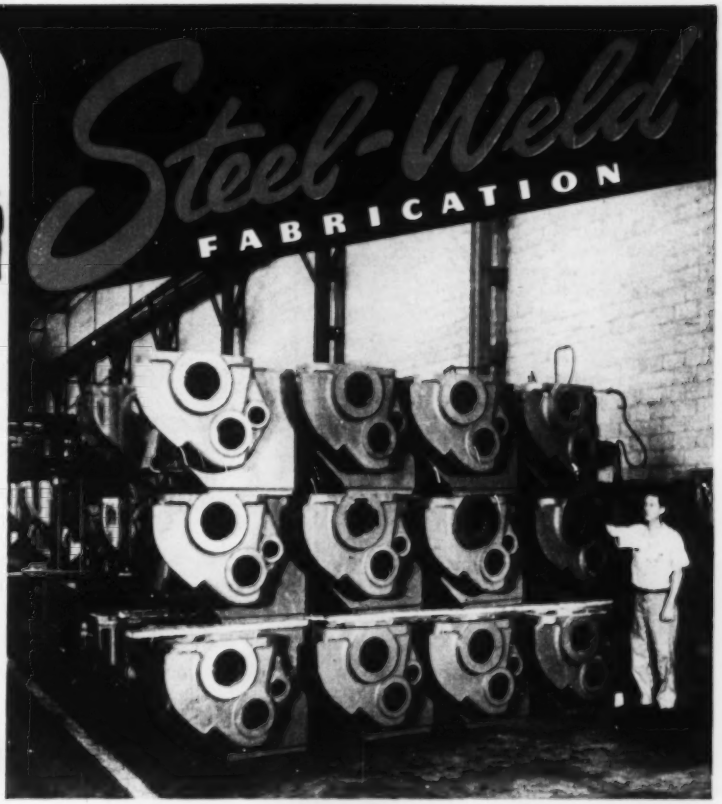


Diesel Engine Crank Cases and Frames for the Marine and Electro-Motive Field.

Pressure Vessels for the Chemical and Allied Industries.



One of Several Parts of a Catalytic Cracking Plant Produced for the Petroleum Industry.



Use WELDED STEEL for Greater Strength with Less Weight!

Mass production of these massive clutch and drive housings for a twenty-one ton tractor is further evidence of the design trend in modern machines . . . it is a typical example of how alert manufacturers are today employing Steel-Weld Fabrication to good advantage in the construction of their products. Thousands of such heavy machinery parts and assemblies are now produced and machined by Mahon for many manufacturers throughout the country. If savings in either cost or time can be effected in your product through Steel-Weld Fabrication of parts, or, if you are cramped for manufacturing space, it will pay you to investigate Mahon facilities. You will find in the Mahon organization an unique source with complete, modern fabricating, machining and handling facilities for any type of work regardless of size or weight . . . a source where skillful designing and advanced fabricating technique are supplemented by craftsmanship which assures you a smoother, finer appearing job embodying every advantage of Steel-Weld Fabrication.

THE R. C. MAHON COMPANY
DETROIT 34, MICHIGAN

Engineers and Fabricators of Steel in Any Form for Any Purpose

MAHON

The Dayton "Twins" cut V-Belt Costs!

I'm "THOROBRED"—for "typical" drives with normal diameter pulleys!

The famous Dayton Thorobred is made with *three prime sections:* 1. *Tension* section specially compounded to give and flex easily as belt goes around pulleys, to provide greater gripping power and cooler running . . . 2. *Strength* section of electronically processed high-tenacity rayon cords for great strength and long life . . . 3. *Compression* section combines great crosswise rigidity with easy compression—prevents squashing and bulging in pulley grooves. No wonder Thorobreds give you so much more *belt life* for your money!

I'm "COG"—for "tough" drives...small pulleys...short center distances!

The Dayton Cog-Belt* makes tough drives easy! Scientifically designed to bend as easily as your finger, the Cog carries 40% more power than conventional V-Belts—5 Cog-Belts do the work of 7 conventional belts! Because it *bends* easier, the Cog-Belt operates over smaller pulleys and shorter center distances. The Cog-Belt can save 28% of your drive weight—47% of your drive space! And the Dayton Cog-Belt *outlasts* any other V-Belt on tough drives, because since it bends easier, it runs *cooler*. Prove it to yourself on your "problem" drives!

*T.M.

See "Belting" in the yellow pages of your telephone directory, for the name of your Dayton Distributor. He can tell you which Dayton "Twin" will save the most money on your drive!

DAYTON RUBBER COMPANY • DAYTON 1, OHIO

Dayton Rubber

Since 1905

WORLD'S LARGEST MANUFACTURER OF V-BELTS

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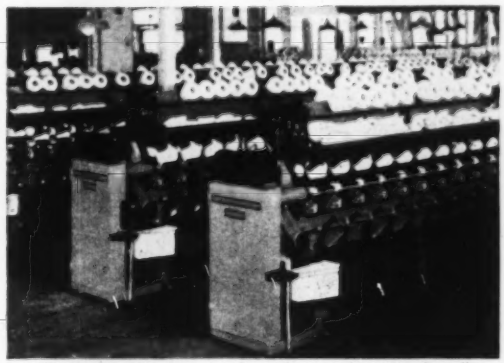
Textile machine shelves get Lasting Enamel Adherence



Winding machines inspect and transfer yarn from several small bobbins onto a single large cone, giving the textile mill a large volume of inspected yarn in one convenient package. Cones are stacked on enameled Electro Paintlok shelves for pick-up. Bobbins are stored in three-quarter-round enameled Electro Paintlok troughs.

BECAUSE yarn must be kept free from lint, snags, oil, dirt, and scale, winding machine shelves and troughs require a smooth, long-lasting enameled finish—one that's easily-cleaned and rust-resistant. For these reasons, this textile machine manufacturer has standardized on Republic Electro Paintlok for both shelves and troughs.

Electro Paintlok is Republic's zinc-coated sheet steel that's chemically-treated to *take* and *hold* paints, lacquers and synthetic enamels. As an official of this company puts it, "We like the way Electro Paintlok always takes a smooth, enameled finish." Even if the enameled surface becomes scratched or broken in use, the tight zinc coating retards the spread of corrosion.

Like more information about Electro Paintlok and its application to *your* painted and enameled steel products? Then, you'll find booklet 525 interesting, informative, factual. Write for your free copy.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Photo courtesy of Universal Winding Company, Providence, R. I.

Republic
ELECTRO ZINC PLATED SHEETS
Electro Paintlok • Electro Zincbond

REPUBLIC STEEL

Other Republic Products include Carbon, Alloy and Stainless Steels—Sheets, Strip, Plates, Bars, Pipe, Tubing, Bolts and Nuts, Wire

Easier, smoother break-in, longer subsequent wear

Get over the hump of break-in with the friction parts of an engine and you've got a big trouble-source eliminated. And that's one thing Parco Lubrite does—it prevents scuffing and scoring during break-in operation. The Parco Lubrite coating, non-metallic and integral with the metal, is oil-absorbent and maintains lubricant in the tight fit of new parts and so assures easy and smooth operation.

The Parco Lubrite coating promotes longer subsequent service because the parts wear in easily to close mating of parts and bearing surfaces.

Treatment of parts with Parco Lubrite is a chemical process which produces results of uniform, high quality and operates with simplicity and efficiency.

For full information about Parco Lubrite, write for free technical bulletin.

* *Bonderite, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.*

Parker *RUST PROOF COMPANY*
2158 E. Milwaukee Ave.
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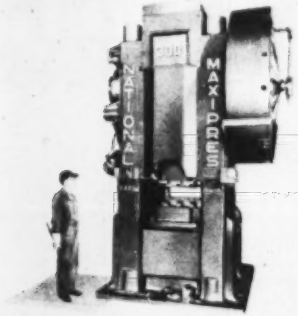
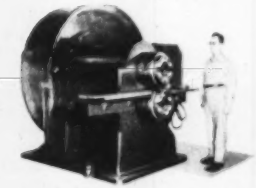
BONDERITE—corrosion resistant paint base • ***BONDERITE and BONDERLUBE***—aids in cold forming of metals • ***PARCO COMPOUND***—rust resistant • ***PARCO LUBRITE***—wear resistant for friction surfaces

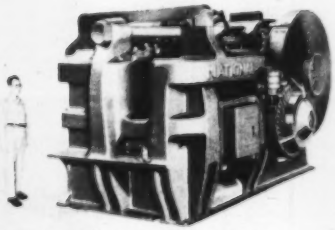
National's Diaphragm-Type Heart of Steel . . .



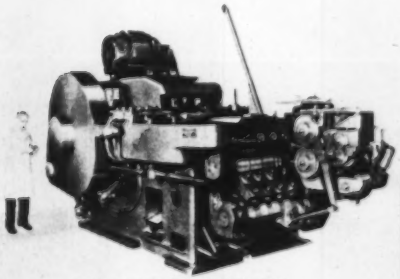
*ON DIRECT-DRIVE MAXI-PRESSES



*ON REDUCEROLLS



*ON HIGH DUTY FORGING MACHINES



*ON LARGE NUT FORMERS

GIVE A FORGEMAN A CLUTCH HE CAN COUNT ON!

Imagine a simple, single-plate clutch for high-performance forging machinery, one that has already demonstrated its ability to stand up to the abuse of millions upon millions of deflections and remain trouble-free.

National-pioneered Diaphragm Clutches* came on the scene in 1944, filling a forge-shop need born of World War II. Hundreds are now in service, rewriting all the old records for length of operation without clutch problems.

You can't have a "boy" of a clutch on high speed forging machinery. Diaphragm Clutches are "men" with hearts of steel that beat unfailingly, far beyond the forge-man's fondest hopes.

Diaphragm Clutches are just one more important reason underlying the depend-ability of National equipment, backed, of course, by years of pioneering and up-to-the-minute engineering for the forging industry.

We invite you to apply National's experience in hot or cold forging. Send us your prints or samples. Better yet, visit us. No obligation.

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MACHINERY COMPANY
TIFFIN, OHIO—SINCE 1874

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS • BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS

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From the complete line of 76 models built in LeBlond's 11-acre plant

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WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • *FOR MORE THAN 64 YEARS*

For deeper, more uniform hardness on steels of critical hardenability—

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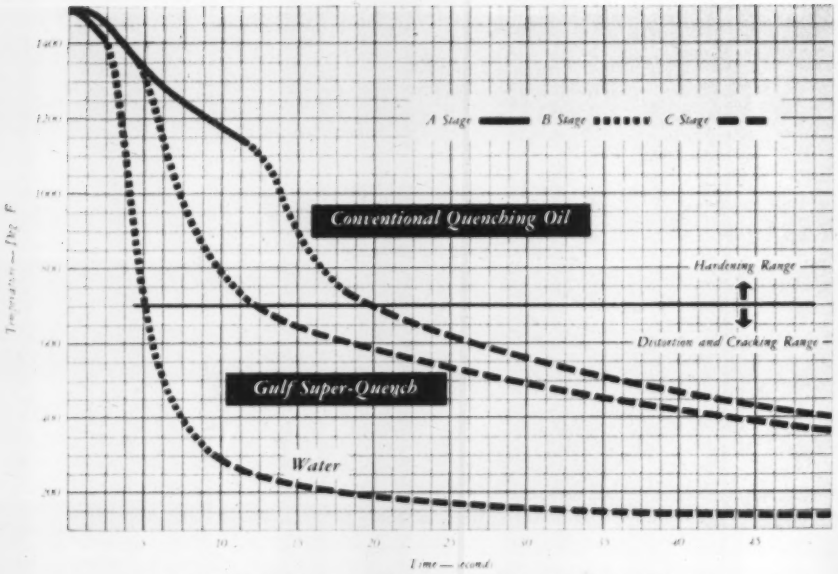

Center cooling curves, 18-8 stainless steel specimen ½ in. diameter x 2½ in. long, quenched from 1500°F.; oil temperature 120°F.

Is the current alloy shortage creating a heat-treating problem for you? Must you accept alloy steels with less nickel, molybdenum, and chromium than you specify or hope to obtain?

Perhaps your problem can be solved through the use of Gulf Super-Quench. Because of its greater quenching power, this superior quenching oil helps offset the lower hardenability of today's substitute steels.

As shown above, Gulf Super-Quench passes through the vapor transport stage far more quickly than conventional quenching oils. This means that the cooling rate is extremely fast at the outset, an important factor in the depth and uniformity of hardening. In the succeeding stages Gulf Super-Quench has a slow cooling rate, like that of conventional quenching oils, and therefore has the same minimum tendency toward distortion and cracking.

Greater quenching power of Gulf Super-Quench adds up to greater depth of hardening and more uniform hardness! One of the most practical advantages of Gulf Super-Quench is greater uniformity of results on steels of variable hardenability.

For further information on Gulf Super-Quench, call in a Gulf Sales Engineer today. Write, wire, or phone your nearest Gulf office.

Gulf Oil Corporation · Gulf Refining Company
Pittsburgh 30, Pennsylvania

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HAMMERED
—for maximum strength and toughness . . .

This is the billet of steel 4¾" x 4¾" x 18½" which is forged into this diesel connecting rod 3 feet long, weighing 84 lbs.

What a forging this diesel connecting rod is! Three feet in length (the average automobile engine's connecting rod is less than a foot long) weighing 84 pounds (against 4 pounds for the automobile connecting rod) it starts as a hot billet of steel 4-3/4 inches square by 18-1/2 inches long, which is hammered between two dies for seven different operations to form the completed forging shown.

Such a diesel connecting rod must stand terrific stresses and strains. It transmits the power from the explosion in the cylinder by way of the piston and piston pin to the crankshaft to the flywheel and thence to whatever the engine is driving.

Thousands of hammer forged connecting rods are working for you every day.

CHAMBERSBURG ENGINEERING CO. • CHAMBERSBURG, PA.

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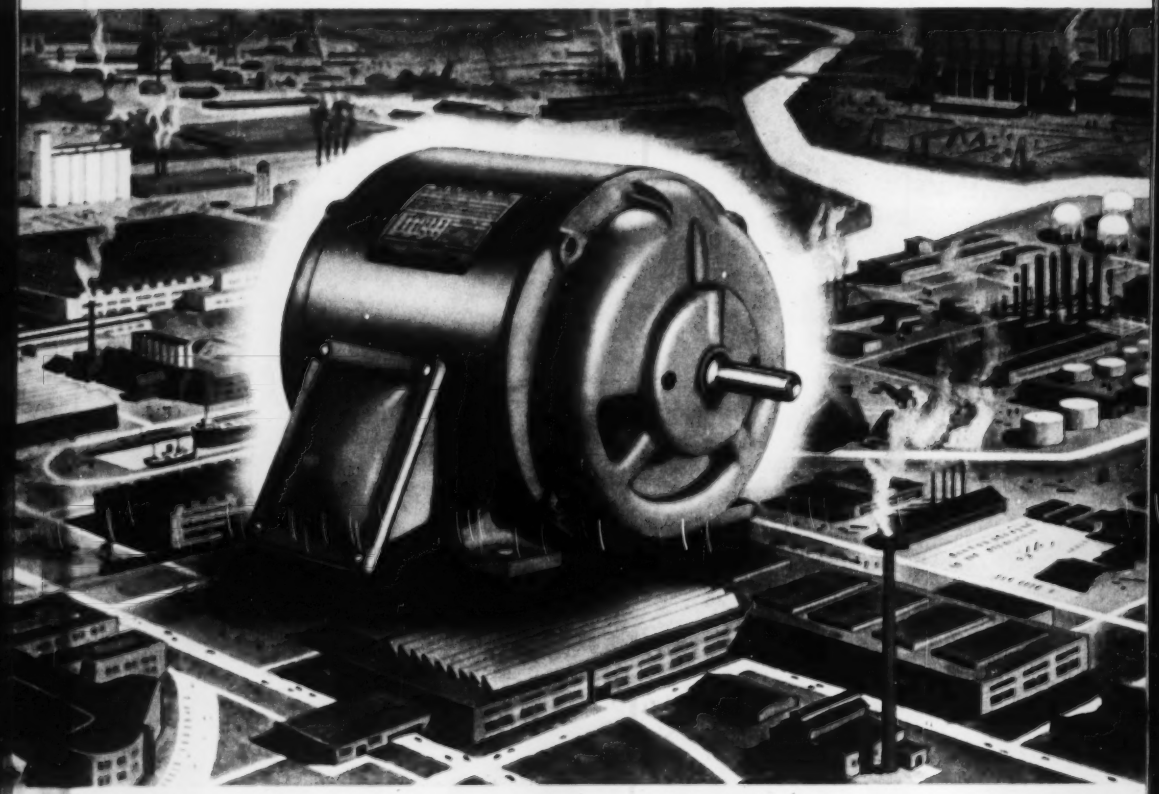


Everywhere in Every Industry, this Fact is Being Proved...

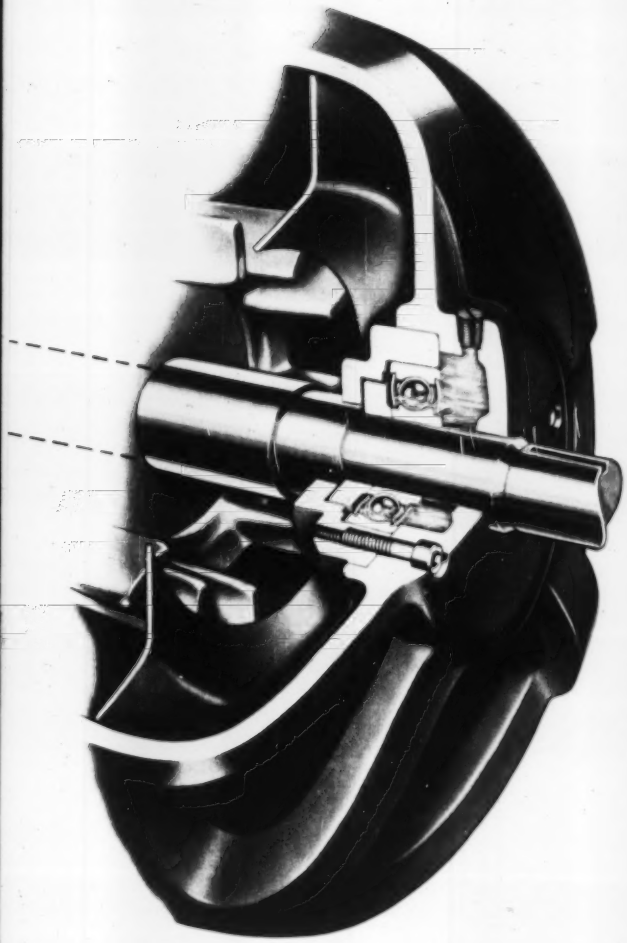
"All Motors are not alike"

By their superior performance—frequently in rugged 24-hour-a-day service—Reliance Precision-Built A-c. Motors are proving in every industry that *"All Motors are not alike"*. Here are motors which are made differently and made better—to deliver dependable power longer. Their original factory bearing lubrication, for example, provides more operating hours before re-lubrication is necessary than that of any other pre-lubricated bearing. And on the next page you will find a check list of features which combine to make the Reliance design the best pre-lubricated bearing design you can obtain in any motor made today!

Precision-Built

15 REASONS WHY . . .

the RELIANCE Pre-Lubricated Bearing Design is the BEST in Electric Motors



- Bearing sealed from dirt and other foreign material.
- Enclosed bearing housing.
- Bearing can be re-lubricated without being disassembled.
- Motor can be re-greased without removing drain plug.
- Automatic grease relief to suit any lubrication system.
- Protection against grease entering windings.
- Balls free of direct pressure during lubrication.
- Bearing can be removed without danger of distortion.
- Reservoir to protect against under-greasing.
- Standard commercial ball bearings.
- Larger grease reserve than provided with any standard bearing.
- Grease supply free of churning action.
- Measuring unnecessary to prevent over-greasing.
- Unnecessary to grease equally at each side of ball race.
- Lubricant is retained in ball race.

Write for Bulletin detailing all of the advantages you get with the RELIANCE Pre-Lubricated Bearing Design

Cutaway views, comparison chart and statements by bearing manufacturers offer more complete evidence of the superiority of the Reliance Pre-Lubricated Bearing Design. Specify Bulletin B-2201.

Reliance PRECISION-BUILT A-c. Induction Motors available from 3/4 to 300 horsepower

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RELIANCE ELECTRIC AND ENGINEERING CO.

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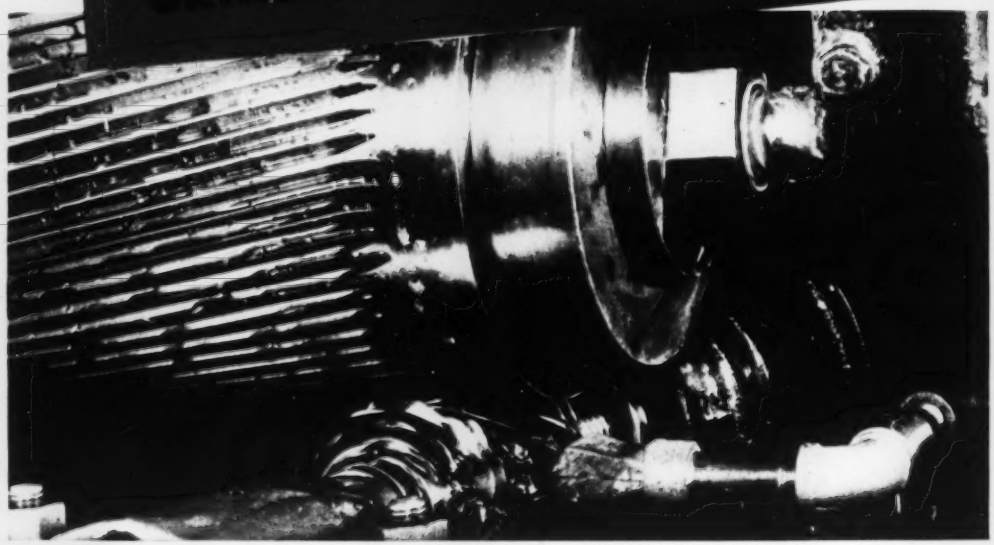

LONGER tool life means greater production because there's less downtime for tool changes. Actual job records from plants in all parts of the country show tool life increases up to 300% when the proper *Texaco Cutting, Grinding or Soluble Oil* is used.

There is a complete line of *Texaco Cutting, Grinding and Soluble Oils*. Thus, whatever the metal or your method of machining, there is a Texaco cutting fluid to help you do it better, faster, and at lower cost. In addition, you'll get better finish, often saving extra operations; and reduce your rejects, thus saving critical material.

For oil film roll necks, use *Texaco Regal Oil*. It's turbine-quality for heavy-duty service. Resists oxidation, emulsification, sludging. For heavy-duty enclosed gears and bearings, use *Texaco Meropa Lubricant*. It stands up under heavy service, does not foam.

Call in a Texaco Lubrication Engineer specializing in metal working. He'll gladly work with your production men to see that the *right* lubricants and cutting fluids are used *right* on every job. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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STEEL

The Metalworking Outlook

April 21, 1952

More Ammunition

A government edict granting wage boosts and other benefits to steelworkers will give high-powered ammunition to the steel companies in their legal battle to contest President Truman's seizure of the mills. The court fight showed little progress last week, although Inland Steel Co. pressed for a declaratory judgment stating that the President's action is illegal. No injunction was sought. Judges thus far have blocked most of the cases on the grounds that the steel companies showed no specific damages resulting from seizure. With higher wages, the steel companies can prove specific damages by showing how the relationship between steel prices and employment costs is thrown completely off balance. Even before the steel case started, the relationship was askew. U.S. Steel Corp. prices in 1951 were 77.9 per cent above the 1940 average; the cost of living rose 85.5 per cent; but hourly employment costs soared 127.5 per cent.

Peak in Defense Build-up

We're nearing the peak of the defense expansion in terms of its effect upon the economy. The defense build-up will continue, but not so fast, and gone will be some of the stimulus to the economy that the rapid expansion means. By the end of 1952, manufacturing capacity will have been increased by almost 50 per cent since the end of World War II—well in excess of our normal growth. Coming early next year may be a mild business hangover, the price for our economic high living. Outlook for the rest of this year is still good.

Credit and Construction

Watch for a relaxation of credit controls on construction of business buildings. Generally overlooked has been the stringency of those curbs. Under present rules, builders have to advance sums amounting to about 50 per cent of the estimated cost of the project. Normally, initial financing amounts to about one-third of the cost. If federal planners ease the restrictions, get set for a sharp spurt in building activity. More liberal housing credit regulations are already having effect. In March 98,000 new units were started, the highest on record for the month except in 1950.

New Market for TV

Only about ten new television stations will get into operation this year. Federal Communications Commission's lifting of the ban on new units will mean that eventually the country will have about 2000 in operation, in contrast to the 108 on the air today. New markets will eventually be opened up for television set manufacturers who have sold about 16 million sets to people served by present stations.

Production-Engineering News—p. 79 *The Market Outlook—p. 141*

Some producers think the sales saturation point is rapidly approaching in the old market.

Nonferrous: In Better Supply

Fourth-quarter aluminum allotments to the small fabricator may be 75 per cent of the base period. Second-quarter allocations are 50 per cent. Prospects for copper are improving steadily, and the free world's nickel output has increased from 259 million pounds annually since the beginning of the Korean war to about 303 million pounds yearly. The entire nonferrous supply situation is better (p. 153).

"Suspended" Controls?

Be on guard against the administration's attempt to "suspend" controls rather than actually do away with them. That's the latest idea of some federal planners in their not-unexpected attempt to hold their powers. OPS Director Ellis Arnall is one advocate of suspension, rather than outright decontrol.

The U.S. Cracks Down

Enforcement of government controls is tightening still more. NPA is cracking down on users of aluminum especially (p. 53), and OPS says it will now publish the names of all violators even if some of the defaults were unintentional. Both agencies are still concentrating their investigations in the Midwest.

Senator Moody Protests

The Defense Department will soon be more liberal in redetermining prices on government contracts when the contractor can prove that an unforeseen and legitimate cost hike pares profits. The department has been tough on that matter up until now, but it is forced to reconsider because of sharp criticism by Sen. Blair Moody (Dem., Mich.) and his Small Business Subcommittee.

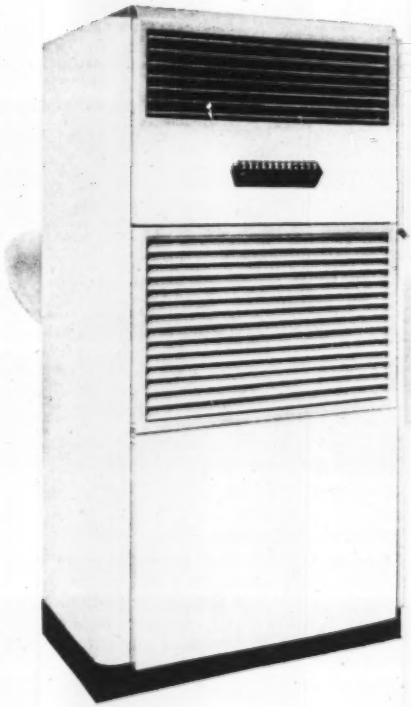
Straws in the Wind

General Electric Co. will lay off 5500 refrigerator division employees in Erie, Pa., for one week beginning Apr. 21 for "an inventory adjustment" . . . Aircraft Industries Association charges that railroads are getting "extortionate" rates in shipping plane parts . . . S.2223, the bill to transfer to the Navy the government-owned magnesium foundry at Teterboro, N. J., has been passed by the Senate and awaits House action.

What Industry Is Doing

Other labor pots will come to a boil once the steel mess is finally cooked (p. 51) . . . The construction use of aluminum may reach 3 billion pounds annually within the next five years (p. 53) . . . More nonferrous scrap is available (p. 54) . . . A new freight carbuilding program that calls for production of 11,000 a month by October is in the works (p. 55) . . . Freight rates go up again May 2 (p. 55) . . . Twice as much structural steel will be available for commercial construction in the third quarter as in this (p. 56) . . . More steel—9,383,000 net tons of ingots—was turned out in March than ever before in a month (p. 57) . . . Free pricing of steel will soon occur in West Germany for the first time in 20 years (p. 63).

There's a superb WESTINGHOUSE UNITAIRE® CONDITIONER



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available now...

... through your Westinghouse Air Conditioning Distributor. The UNITAIRE is completely factory-assembled and ready for use. Installation is simple and fast. It does not require hard-to-get materials. These units are adaptable, too. They can be applied singly or in multiple to condition anything from a single room to an entire floor or building.

Best of all, the UNITAIRE is the best looking, most reliable air conditioner you can buy. One reason is the famous Westinghouse hermetically-sealed compressor. There are other important reasons your Westinghouse Air Conditioning Distributor will be glad to explain. Call him today; he's listed in the Yellow Pages of your telephone directory. Or, write for free booklet to Westinghouse Electric Corp., Air Conditioning Division, Hyde Park, Boston 36, Mass.

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ARMCO 17-7 PH

for lightweight formed structurals

MECHANICAL PROPERTIES
of Armco 17-7 PH Compared With Type 301

	ARMCO 17-7 PH SOFT TEMPER		TYPE 301	
	As Supplied (Annealed)	Fabricator Treated (1400 F plus 950 F)	Half Hard	Full Hard
Ultimate Tensile Strength, Psi	130,000 typ. 150,000 max.	215,000 typ. 185,000 min.	150,000 min.	185,000 min.
Yield Strength in Tension, Psi (0.2% offset)	40,000 typ. 55,000 max.	200,000 typ. 165,000 min.	110,000 min.	140,000 min.
Elongation in 2 in., %	30 typ. 20 min.	9 typical 6 minimum	15-18 min.	8-9 min.
Hardness, Rockwell	B92 max. B85 typ.	C45 typ. C41 min.	C-32	C-41
Modulus of Elas. Long.	29,000,000	29,000,000	28,000,000	28,000,000
Density, Lbs. per cu. in. at 70 F	0.282	0.278	0.29	0.29

Typical Short-Time High-Temperature Properties
of Armco 17-7 PH, Soft Temper Fabricator-Treated (1400 F plus 950 F)

Temp. Degrees F	Ultimate Tensile Strength Psi	0.2 Per Cent Yield Strength Psi	Elongation in 2 in. Per Cent	Rockwell Hardness
70	206,500	184,500	9	C 45
300	194,500	174,000	8	—
400	189,000	167,000	6	—
500	180,000	154,000	6	—
600	171,000	141,500	6	—
800	153,000	116,500	8	—

STRENGTH-WEIGHT RATIOS
for Armco 17-7 PH Soft Temper
Fabricator-Treated (1400 F plus 950 F)

Strength Property		Ratios Obtained by Dividing Property at Indicated Temperature by Density			
		70 F	300 F	600 F	800 F
Ultimate Tensile Strength, Psi (X 1,000)	Typical	775	700	615	550
	Minimum	665	—	—	—
Yield Strength in Tension, Psi (X 1,000) (0.2% offset)	Typical	720	626	510	419
	Minimum	593	—	—	—
100 Hr Stress—Rupture Strength, Psi (X 1,000)		—	—	583	446
Creep Strength, Psi (X 1,000) (0.1% in 1,000 hr)		—	—	521	180
Modulus of Elasticity, Psi (X 1,000,000)		104	—	—	—

Here is a stainless steel that *has* the best combination of qualities required for lightweight formed structurals.

High Strength-Weight Ratios

At Normal Temperatures:
Strength-weight ratios of Armco 17-7 PH Soft Temper (after hardening) are superior in some instances to the newly introduced non-ferrous light alloys.

At Elevated Temperatures:
Up to 800 degrees F Armco 17-7 PH maintains high strength and *improves* its strength-weight ratios in comparison with the non-ferrous metals, which weaken rapidly above 300 degrees F.

Easily Fabricated

Armco 17-7 PH is supplied in the annealed condition suitable for intricate drawing and forming operations. It is heat treated *after working* by the fabricator. Its high strength is developed through a precipitation-hardening treatment at temperatures of 1400 and 950 degrees F — low enough to avoid serious distortion. On the other hand, High Strength Type 301, the standard stainless structural grade, is supplied in a highly work-hardened condition. Fabrication is difficult and results are often non-uniform.

Other Advantages

Armco 17-7 PH Soft Temper, after hardening, has a yield strength in compression *as good or better than* the yield strength in tension. It has good high-temperature tensile, creep and stress-rupture properties, as well as excellent corrosion resistance.

How Supplied

Armco 17-7 PH Soft Temper is supplied in sheets, strip, plates, angles, special shapes, bars and wire.

Other PH Grades

There is also a "Hard Temper" Armco 17-7 PH and a bar grade, Armco 17-4 PH. For full information write for data on Armco Precipitation-Hardening Stainless Steels.

ARMCO STEEL CORPORATION

2022 Curtis Street, Middletown, Ohio • Plants and Sales Offices from Coast to Coast. Export: The Armco International Corporation

MORE SCRAP MEANS MORE STEEL • TURN YOURS IN TODAY

Stockholders Are People

This is a sober call to Americans to rally to the defense of legitimate profits against the demagogic attacks of President Truman and misguided public office holders who condone his unwarranted assaults against the rights of those who derive income from investments.

God knows that Mr. Truman in his address accompanying seizure of the steel plants, approached dangerously close to Hitlerish tactics in inflaming public indignation against the steel companies. But his intemperate diatribe was mild compared to the bitterness of the transcribed radio comments last Wednesday evening of Price Stabilizer Ellis Arnall and Sen. Wayne Morse of Oregon. In voices choked with emotion they attacked Clarence B. Randall viciously for his rebuttal of President Truman's unfair seizure speech and charged the steel industry with outrageous profiteering. They were inciting public wrath against the steel industry on the grounds that its profits since Korea have been exorbitant.

Why do these men of presumably high intelligence and conscientious scruples descend to such lengths to discredit profit and to incite class enmity between wage earners and owners? The charitable assumption is that they do not comprehend the role of profits in our economy. A second explanation is that they have a low regard for investors.

On this score, Ellis Arnall let the cat out of the bag when he told members of the National Press Club that there are 154 million Americans who are neither steel stockholders nor members of the steel union and that it is his job to protect the 154 million.

What asinine reasoning! It implies that there are so few stockholders that their votes don't count. It implies that the function of investors is inimical to the public interest. It questions whether stockholders have any rights. It is a downright insult to every American who has a mortgage on his home, has a life insurance policy or owns a few shares of stock.

The current frontal assault on investors calls for an aggressive battle on behalf of investors and their rights. It is the duty of every industrial executive to rally to this cause—to convince Washington officialdom that stockholders are people.

E. L. Shaner

EDITOR-IN-CHIEF

"PURE" FLOOD CONTROL: While viewing the havoc wrought by swollen rivers in the Middle West last week, President Truman declared that it is high time that the nation do something to prevent a recurrence of such devastating floods. He invited the governors of seven stricken states to assist him in "lobbying" for an over-all Missouri basin program.

Every sensible person will agree that intelligent flood control deserves more attention than

it has received. One trouble has been that every time a sensible plan is proposed, zealots of government ownership rush into the act to make federal production of light and power and other excursions of the government into business integral parts of the flood program.

Divorce government ownership from the purely engineering phases of the control of rivers and you will have hope of relief from recurrent floods.

* * *

INTRODUCING CERMETS: In leafing through this issue, we learn that cermets (p. 82) are metallic oxides, such as alumina, having a high melting point, which are pressed and sintered with a metal in a manner similar to that employed in making cemented carbide cutting tools. Carbides, oxides, chromium, titanium, beryllium, cobalt and tungsten are being used in experiments with cermets.

Recently a test was conducted on a titanium carbide with 5 to 30 per cent of cobalt, molybdenum and tungsten. It proved that conglomerates of this kind are much more satisfactory under laboratory conditions at temperatures of 1800 to 2200° F. than the best of the high temperature alloys presently available. Now that we are in for new materials that will fulfill the exacting requirements of this age of nuclear fission, jets and gas turbines, perhaps we will have occasion to become much more familiar with this aptly coined word—cermets.

* * *

WHAT % FOR RESEARCH? In writing on the subject "Planned Research Is Profitable Business Insurance," Malvern J. Hiler, president of Commonwealth Engineering Co. (p. 85), presents interesting figures on the amounts industrial companies spend for research. The average for the nation is 2 per cent of gross sales. In the metalworking industry, companies with gross sales up to $500,000 annually spend about 3 per cent on research. Larger establishments with gross sales ranging up to $5 million, spend about 1.3 per cent. Roughly, therefore, expenditures for research range from $15,000 a year for the smaller company to around $65,000 for the larger one.

A survey shows that about 60 per cent of metalworking companies support their own research programs and that 65 per cent of these have their own research laboratories. Nearly 50 per cent also used outside research facilities. The author recommends what he calls a "technical audit" as a good guide as to the research requirements of a company.

* * *

NO PROFITEERING HERE: If net sales of 30 steel companies representing 95 per cent of the nation's steel ingot capacity in 1951, amounting to $11,228 million, are assumed to be one dollar, here is what happened to that dollar: Wage earners and salaried employees received 30.4 cents. Uncle Sam took 11 cents in taxes. Costs of materials, services and other operating expenses took 52.9 cents. These total 94.3 cents, leaving 5.7 cents for net profit. Of these 5.7 cents, 2.6 cents went to owners in dividends and 3.1 cents went into surplus for a rainy day.

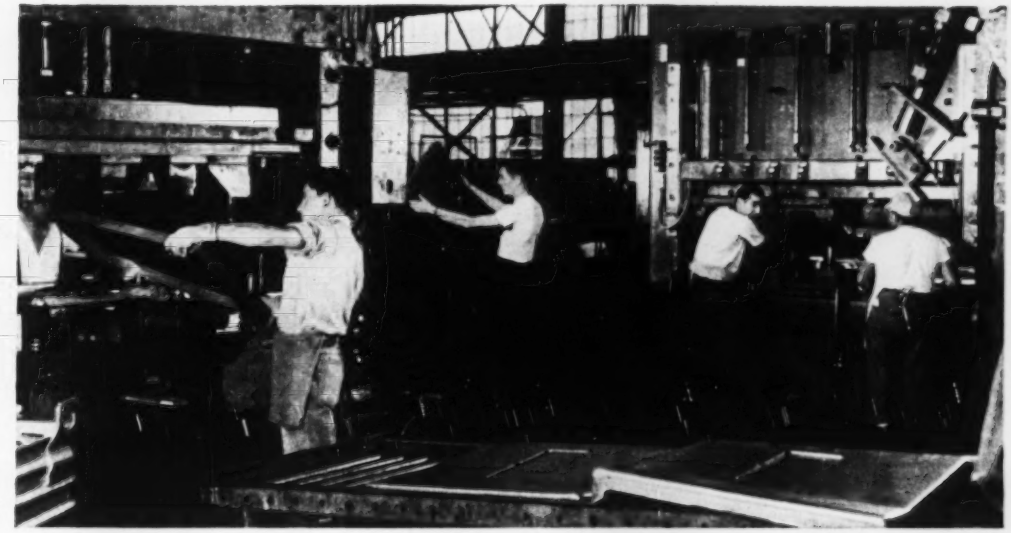
During 1951 the consolidated balance sheet of these 30 companies showed a decline in the current ratio from 2.26 to 1 in 1950 to 1.94 to 1 in 1951. Most industrial executives strive for a 2.5 to 1 ratio as a desirable minimum. Study steel's financial report for 1951 as critically as you can and you will find no valid cause for complaint as to excessive profit.

* * *

INVITES CO-OPERATION: American Standards Association on Mar. 24 approved new standards for square and hexagon bolts (p. 86). The official title is "ASA B 18.2 — 1952. Square and Hexagon Bolts and Nuts."

Sponsored jointly by the Society of Automotive Engineers and the American Society of Mechanical Engineers, the new standard eventually will benefit both producers and users of fasteners. The number of items made will be reduced; inventories of manufacturers, distributors and users will be simplified; and the number of wrench openings involved in the handling of these fasteners will be cut by at least 40 per cent.

At first glance the standards may confuse some consumers. Certain sizes are included which, while now specified, can easily be eliminated by industry co-operation. Realists point out that only when consumers restrict their specifications to the new recommended standards can the program be pronounced a success. In short, here is a definite challenge to industry co-operation.

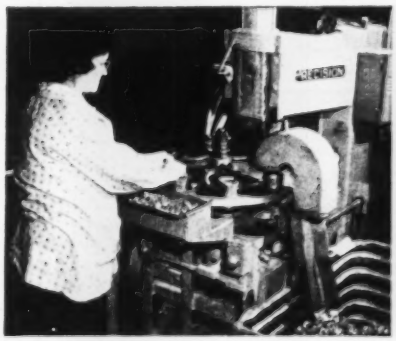


Firestone SPEEDS DEFENSE SUB-CONTRACTS WITH NEW AUTOMATIC MACHINES AND LOW-COST PRODUCTION

SUB-ASSEMBLIES and STAMPINGS for Ordnance Vehicles, Ordnance Equipment, Aircraft, Aircraft Accessories, Appliances, Automobiles and Trucks.

Firestone's enlarged, modernized Metal Stampings Division is geared to the tough jobs in large-size metal stampings and difficult sub-assemblies. Diversified metal fabricating facilities from blanking through to painting or polishing are applied to fast, low-cost production of stampings and sub-assemblies so vital to the on-time, speedy delivery of ordnance and aircraft equipment and accessories. If your problem is large-size stampings in a hurry, wire or phone Metal Stampings Division, Firestone Steel Products, Akron 1, Ohio.

Copyright, 1952, Firestone Steel Products Co.



Welding of small parts is integrated into sub-assembly production for intricate metal stampings.

Washing, bonderizing, painting and baking are handled in a continuous automatic operation under constant quality maintaining supervision.

RYERSON STEELGRAMS

Following are a few paragraphs on the steel situation as we see it here at Ryerson. We hope you will find the information helpful in planning your steel purchasing.

Warehouse steel prices, frozen at 1950 levels throughout 1951, are now determined by Government formula based on monthly average cost, including transportation charges, plus mark up. In beginning, we adjusted prices monthly to keep within Government Regulation. Now we have established prices on most products sufficiently below OPS ceilings to avoid monthly changes as prices vary.

Steel procurement: Though most steel products are still in short supply, production is catching up with demand on some kinds and sizes. On carbon steel bars, for example, larger sizes are short—but our stocks of smaller sizes are fairly good in both hot rolled and cold finished. And both hot and cold rolled carbon steel sheets are also coming into better supply—especially cold rolled, although 19 gauge and lighter are not in as good supply as the heavier gauges.

Our picture, briefly, on other products: Mechanical tubing—welded in good supply, seamless still tight. Alloy bars—over all stocks improving but still unbalanced as to sizes. Structurals and plates—demand still exceeds supply. This was our situation immediately after Government seizure of the steel mills. How it will be affected by events of the coming weeks we cannot, of course, predict.

More on stainless—Now you only need money to buy straight chrome stainless—no Government allotments or ratings of any kind are required. And as for money, the straight chrome types cost less than the nickel-bearing stainless steels they replace.

While the use of chrome stainless was originally forced on manufacturers by Government restrictions on nickel, many companies have indicated that they may continue to use it—even when the 18-8 steels are again available. In other words, it took restrictions to reveal the possibilities of 430 and other straight chrome types. Ryerson has large and diversified stocks of these steels.

Another change in alloy steel stocks is taking place in line with a new NPA practice. Steels affected—interim and boron alloys. Warehouses will be limited to .60 nickel and .15 moly in carburizing types and .40 nickel and .15 moly in direct hardening types. These continuing changes emphasize again the importance of knowing exactly how unfamiliar alloys will react—knowledge supplied by the hardenability information sent with every shipment of Ryerson certified alloys.

Under the Government's Mills Plan, corporations must pay 70% of 1951 taxes in the first half of this year, and next year, law requires 80% payment in first half! Until last year, payment of only 50% in the first half was accepted practice. So this represents a considerable shift in the burden of cash requirements and may call for special fiscal planning by many companies. If your steel purchasing picture is affected, we suggest you discuss the matter with one of our experienced credit men.

Fabricators who apply to NPA for ratings to purchase metal working machinery are finding it is not necessary to have contracts directly connected with the defense program. Those with work essential to civilian economy can easily get a rating, too.

Babbitt procurement: Purchase of high tin babbitt still requires an M-8 certification, but Glyco babbitt from Ryerson, which has physicals equal to those of high tin types, is still available to all without a rating of any kind. And Glyco costs only about half as much...Our deliveries on alloy forgings are improving. Wire rope and chain—prompt shipment in a wide range of types and sizes.

As a substitute for cold drawn seamless mechanical tubing, Ryerson tubing specialists are recommending a welded tube identified as bright-finish hot rolled. this tube comes in a wide range of round and square sizes. Costs substantially less than the seamless and has a clean scale-free surface that takes paint very well.

JOSEPH T. RYERSON & SON, INC. STEEL-SERVICE PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • DETROIT • CINCINNATI CLEVELAND • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE • 3-21-52

Labor Drama: New Act Coming

Unions other than the steelworkers get set for a big scene. The biggest performer, the UAW, may not press for more money but it could bring up "right to manage" issues

NEW CHARACTERS are nearly set for the next act of the labor drama once the interminable steel scene is finished.

But the lines for the next actors can't be finalized until all the participants in the steel scene hit upon a clear-cut denouement — which they had not found last week.

It All Depends—The outcome in the steel case will influence labor relations with about every organized worker in the country, but the solution will have the most profound effect on these major metalworking or related industries: Steel fabricating, aluminum, copper, coal, electrical, automotive, oil and rubber. Most metalworking companies have cost-of-living clauses or wage-reopening clauses. If they have the former, the effect of the final steel decision will be felt gradually and indirectly through the cost-of-living adjustment. If they have the latter, the effect will be that unions in other segments of the economy will eventually be asking for what the steelworkers get.

Here's your program outlining the situation in major industries:

Steel Fabricating, Aluminum — These seemingly unrelated industries are lumped together because the United Steelworkers of America-CIO has many contracts in both fields. It has 2007 agreements covering 517,506 workers with companies other than basic steel firms. It says it will insist on the same wage hikes for those employes as for basic steel workers. A special Wage Stabilization Board panel has already heard the pros and cons of wage hikes in the aluminum industry, but Phil Murray isn't pressing for a decision until he's set on steel.

Copper—WSB last December approved an average 8-cent boost for most copper workers, but that had to do with last year's negotiations and now the unions are demanding more. Mine, mill and smelter workers want 25 cents an hour plus some fringe benefits.

Coal—John L. Lewis' demands will be out of this world, most operators think. To prepare for the expected fight, Bituminous Coal Operators Association, principal bargaining group for the industry, has signed up most of the Indiana and Illinois soft coal producers. Those operators have long held aloof from joining the national bargaining group, but now they will present a united front to Mr. Lewis. He can call for a reopening anytime after Mar. 31. Thus far he hasn't moved because he wants to see what steel gets, so he can ask for more.

Automotive—Industrial relations men in this field don't expect too much trouble. The United Auto Workers-CIO which represents much of this industry, likes long-term contracts, and has negotiated them with many of the big producers. Industrial relations men are betting that they won't break those long contracts just for a short-term gain they might get as result of the steel case. Most of the contracts have cost-of-living clauses, so the workers would get the effects of the steel hike eventually anyway.

The UAW is pretty happy with its cost-of-living clauses. Workers have won a net gain of 24 cents

What Do Steelworkers Earn? Here's Postwar Pay Story

HOURLY WAGE figures bandied about in the steel case need clarification.

In the steel industry there are actually 32 job classifications, with a different pay scale for each (a 5 cent differential exists between one category and the one above or below it). Usually used in discussions are an hourly wage figure for the lowest scale, the highest scale, an average for all 32 scales, the average wage cost to the industry or average hourly earnings including overtime.

Good arguments can be advanced as to why any of the five pay figures should be used, so STEEL here gives all but one as the postwar pay history of steelworkers employed by a producer in the Pittsburgh district. The one omitted is the figure including overtime; it was left out because it varies considerably. In February it was $1.942, in January $1.958. The average straight pay given here is $1.804 an hour. WSB says it's $1.76. The board bases the figure on a weighting for all steelmaking centers, some of which pay slightly less than does Pittsburgh.

(All Rates per Man per Hour)

Period Beginning	Base Rate	Av'g Straight Time Rate	Highest Wage Class.	Av'g Emp'ee Cost
Jan. 1, '46	$0.780	$1.125	—	$1.376
Feb. 16, '46	0.965	1.340	$1.98	1.431
Apr. 1, '47	1.090	1.464	2.33	1.617
July 16, '48	1.185	1.601	2.58	1.757
Jan. 1, '50	1.185	1.601	2.58	1.904
Dec. 1, '50*	1.310	1.804	2.86	2.121

* Existing at this time

from that part of the contract, although they will probably lose 2 cents of that in the next review. But the autoworkers will be getting 4 cents more an hour come May 29 through the annual improvement factor. The comparative serenity in UAW's automotive ranks is not expected to be mirrored faithfully in many non-automotive workers the union represents, such as those with tool and die shops and North American Aviation. But even there the situation is smoother than in many other segments of industry.

While the UAW is content with its long-term contracts and the cost-of-living clauses, it's envious of the "right-to manage" issues that WSB obliquely recommends for steel (STEEL, Apr. 14, p. 65). The auto union may kick up a fuss for those.

Electrical—The United Electrical workers and the CIO counterpart frankly admit they want to get a clear idea of what's happening in steel before they will deal with companies. UE and IUE talks with General Electric, for example, are recessed until May 5.

Oil—Oil Workers International Union-CIO the most important union in the oil industry has persuaded AFL groups and independents to present a united front. They want 25 cents an hour and insist that the historic plant-by-plant negotiations be discarded. The case was certified to WSB which decided to hold a few pilot hearings in St. Louis and San Francisco. Those came to little and now the whole case is back in Nathan Feinsinger's lap in Washington.

Rubber—United Rubber Workers of America-CIO represents 90 per cent of the industry and it's currently conducting negotiations with much of that 90 per cent. It won more money last November, but will probably press for still greater gains when it figures what the steelworkers end up with. In any event, the rubber workers will use the union shop recommendation in the steel case as a wedge to help them win in the rubber industry.

Many smaller unions independents or little affiliates of the big groups are simply marking time until the pattern in steel emerges. California Metal Trades Association, which helps its many small company members with labor negotiations, reports a decline in such activities in past weeks, as does Associated Industries of Cleveland which performs a similar function for its members.

ASM Lists 1858 Summer Jobs

A free employment service to help engineering students find summer employment, particularly in the metalworking field, was announced by the American Society for Metals. The purposes of the service are to help relieve the shortage of engineers in these industries and to give students first-hand information and training.

From coast to coast, 196 prominent firms have specified 1858 job openings in most departments of production and fabrication. The society's list includes information about the firm, type of job, rate of pay and method of application for the work. It is being distributed to engineering schools and other special groups of interested individuals.

Private Atom Lab Formed

A privately financed nuclear research laboratory for development of commercial atomic power is announced by Walter Kidde Nuclear Laboratories Inc., New York. The firm will perform research, development and experimentation in the field of nuclear energy. Its services will be available to other organizations interested in the design of nuclear power plants or in applications of nuclear technology to their products or processes.

"The problem before us in civilian atomic power is not whether we can do it, but how soon we can make it economical," says Dr. Karl Cohen, technical director of the new laboratory.

Other Kidde enterprises include Walter Kidde & Co. Inc., manufacturers of fire protection systems and pneumatic devices for aircraft and marine application, and Walter Kidde Constructors Inc., an engineering and construction firm specializing in precision tool design and now participating in the atomic program.

AEC Studies Sites for Plant

Site studies, at present concentrated in the Ohio River valley, are still underway by the Atomic Energy Commission, in search for a suitable location of a proposed $1 billion gaseous diffusion plant. About 5000 to 6000 acres will be required with ready access to potential power and water. AEC will build a power plant to supply 1.8 million kw. The expansion plan has not yet been sent to Congress for its approval.

Three Nations Unveil Atom Data

Private industry and educational institutions will have access to additional data on the nuclear properties of uranium as the United States, the United Kingdom and Canada revised and added to the *Declassification Guide* of atomic energy information.

Revisions, resulting from the Fifth International Declassification Conference held in Washington, release data necessary in the development and understanding of low power nuclear reactors for atomic research. Low power natural uranium research reactors cannot be used for production of atomic weapons or power.

The declassification of that technical information is aimed at assisting the expanding manpower training program involved in the atomic energy efforts of the three nations.

More Aluminum Facilities

The government is looking for support from potential aluminum producers

AFTER a round rebuff from American industry for seeking aluminum expansion through a deal with Canada, the Defense Production Administration hitched its belt and tried again. DPA Boss Manly Fleischmann notified American firms that it will welcome opinions from responsible firms interested in negotiating for construction of aluminum facilities.

Prospects—At least two companies, Olin Industries (arms, ammunition manufacturing compan-

ies), East Alton, Ill., and Spartan Aircraft Co., Tulsa, Okla., expressed interest already. One large copper company (other than Anaconda) is also interested.

Samuel W. Anderson, deputy administrator for aluminum in DPA, drafted the plans for a new round of aluminum expansion: A further expansion of U. S. aluminum capacity (140,000 tons a year) and a contract with Aluminum Co. of Canada Ltd. to provide 300,000 tons of the metal annually between 1955 and 1959.

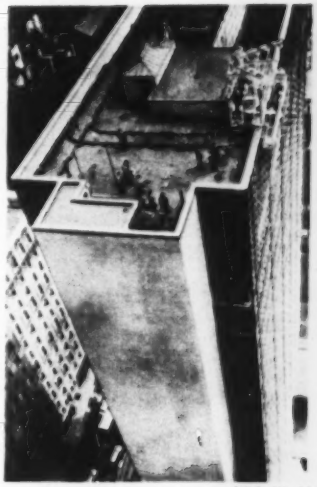
Super Stockpile—Stockpiling is an important feature of Mr. Anderson's plans. The U. S. is already committed to buy about 3 million tons of aluminum from domestic producers in the next five years. The contract proposed with Alcan would commit government buying of over 1 million more tons of the metal. He thinks the Canadian aluminum should be picked up as a sort of super stockpile.

Present aluminum expansion goals are for about 600,000 tons of domestic primary capacity and would bring total U. S. primary capacity to almost 1.4 million tons year, while the remainder will be ready next year.
annually. The bulk of the new facilities wll come into operation this year, the remainder next year.

Aluminum Violators Hit by NPA

A one-year suspension from allocation and priority assistance and from the use of aluminum was imposed on one of the nation's largest manufacturers of storm windows and doors, Alsco Inc., Akron, by NPA. The same suspension applies to Alsco's fully owned subsidiary Alumiwal Corp., also of Akron. The action resulted from the unauthorized use of 3.4 million pounds of aluminum, and follows prosecution of another Akron firm, Alside Inc., last Nov. 30. The first action resulted in a six months' suspension. (STEEL, Dec. 10, 1951, p. 62).

These cases are the forerunners of other charges and criminal actions to be preferred and recommended later this month against other Ohio and Michigan manufacturers of aluminum products, says Bernard Shandler, attorney of the office of the general counsel, NPA.



Wide World

A Job for Human Flies

Because the windows do not open in the window-wall and stainless steel Lever House, New York, thus creating a window-washing problem, an elevator was constructed that runs on tracks on the roof and the sides of the building. The scaffold is operated up and down the 24 floors by push-button

Aluminum Aims Sky High

Construction use six times today's seen in next five years as aluminum output keeps rising

IS MOUNTING aluminum production building for a fall? Where will be the markets for all the aluminum we eventually will be able to produce?

Reynolds Metals Co. believes much of the mounting aluminum production will go into building. Construction today takes one-third of all aluminum produced and is the largest single market for the light metal. Reynolds expects the construction use of aluminum to reach 3 billion pounds within the next five years—nearly double the amount used for all purposes during the peak war year of 1943 and about the amount currently going into building.

Blueprint—The company sees such gains for aluminum in construction because: The lumber supply is getting shorter; aluminum has better corrosion resistance than steel; aluminum's price is steady.

They point to the characteristics of their metal, too: Many ornamental effects are easily obtained through use of extruded sections and special finishes on aluminum; the light metal has good heat reflectivity; it permits important economies in foundation and erection costs, especially with curtain wall construction; and they say fire underwriters favor aluminum construction over wood.

Eight Areas—Construction now has these eight general types of uses:

Roofing and siding account for 200 million pounds of aluminum yearly, or about 40 per cent of the total quantity of aluminum going into construction. Windows and accessories, including window frames, awnings, shutters and ventilators consume about 95 million pounds of aluminum or 20 per cent of that used by building contractors. General construction projects include builders hardware, duct work, fire escapes, lighting fixtures and similar uses necessary for the building yet neither structural nor ornamental. These consume 48 million pounds, or about 10 per cent annually. Ornamental products include moving stairways, grillwork, handrails, marquees and ornamental fixtures using 30 million pounds.

Prefabricated buildings use 21 million pounds, and walls, partitions and ceilings use 15 million pounds. Could a good aluminum prefab be developed, says Reynolds, this market could increase markedly.

Aluminum Walls—Reynolds says the most promising new market could be curtain wall construction. In this type of construction, exterior walls of a building are hung on the structural framework of the building. Since the wall is supported on the framework rather than being self-supporting, it can be made about 24 inches thinner than the conventional will.

Gainer—Final use is in highway equipment, including bridge railings, bridge floorings, bridge structure and light poles. Although the volume of the light metal for these purposes is not significant now, Reynolds sees about 5 million pounds going for these purposes by 1953.

Tide Rises in Scrap Flow

Better movement of nonferrous scrap has eased the burden of collection committees

DISTRESS SIGNALS have changed to "steady as you go" orders in nonferrous scrap drives.

The shift in emphasis reflects an easing in nonferrous scrap movement, which in turn followed improvements in primary metal production, less speculative hoarding and prospects of better imports of nonferrous metals in 1952.

Local nonferrous scrap mobilization committees, sponsored by the NPA and segregated from iron and steel scrap seekers only last December, have already succeeded in shaking loose some nonferrous scrap. Overshadowed by more decisive events in nonferrous supply, the committees are maintaining well-knit organizations, "oiled-up" for any future emergency.

Good Returns — Scrap-conscious NPA also reports "better than ever" returns of military nonferrous scrap from Korean battlefields and World War II war areas, particularly in regard to copper and copper-base alloys.

More important in the short-run situation has been a softening in foreign markets with an increased flow and additional commitments to the U. S. from foreign suppliers of primary tin, lead and copper. With more primary metal coming, there is less incentive to hoard available scrap here at home.

Movement Is Improved — Net results: Over-all supply of nonferrous scrap is adequate. But apparent increases in total supply are misleading, says the NPA. The real story: Less hoarding and better movement to processors, particularly brass and bronze foundries, within the last two or three months. Flow is certainly better than a year ago, but inventories are low and another production spurt would bring on worse pinches than occurred last year.

Nickel continues in spotty short supply; tin is expected to improve with imports already committed; lead is virtually out from under control and zinc may follow.

Crucial Copper — The crisis in copper both in the primary metal and scrap is not yet passed. Currently, wire mills and secondary copper smelters are haggling with the NPA and brass mills and some nonferrous foundries over who is to get the slightly increased scrap supplies.

NON-FERROUS SCRAP
. . . supplies begin to level off

Both the foundrymen and the brass mills say they need all the scrap they can get and that any surplus will naturally flow to the custom smelters for reuse by other refined copper processors. Wire and cable makers say that their share of the copper supply is not enough for them to meet defense requirements and a minimum of civilian needs.

NPA, which is right in the middle, is attempting to stimulate the flow of copper alloy scrap to custom smelters and away from foundries with the object of balancing the supply of refined copper by using some of the alloyed material. Later, when primary copper comes into better supply, the alloyed scrap can be allowed to flow in its normal channels again.

Any anticipated price rise for copper is not holding much scrap out of circulation. Louis Voyer, M. N. Voyer Co., Pittsburgh, says, "The big scrap dealers might be doing some holding, but the small dealers are all turning it over pretty well. Copper is expensive as scrap and they can only hold so much in dollars. It's not like steel where thousands of tons can be held waiting for an increase."

Copper Wire Backlogs Shrink

Electrical apparatus and supply distributors are selling themselves out of business. The Industry Advisory Committee told NPA that inventory replenishment of wire and cable delivered to customers falls short of authorized amounts and their inventories are continually lessening.

To meet this situation, they asked that producers set aside a percentage of their production for delivery on military orders and distribute the remainder equitably on unrated orders to established accounts.

With the exception of the copper wire and cable situation, the general industry supply is satisfactory at present.

Scrap Cobalt, Nickel Sought

Scrap grindings of cobalt, nickel and other scarce materials used in permanent magnets can be refined economically, says the Permanent Magnet Manufacturers Industry Advisory Committee. Manufacturers are asked to first remove as much of the contaminants (sand, grit, etc.) as possible from their scrap, with shipment in carload lots recommended. Salvage of permanent magnets from magnetron tubes used by the armed forces is also under consideration so that critical materials can be reclaimed.

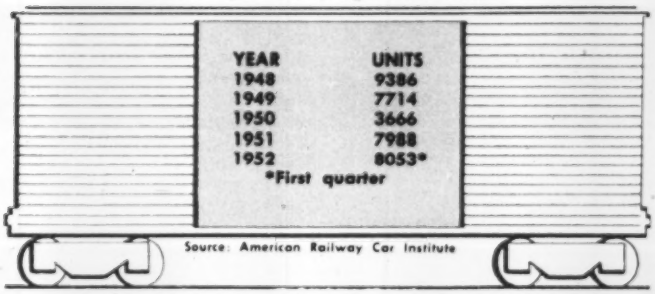
More Metal Per Person in 1951

United States metal producers turned out 1425 pounds of ferrous and nonferrous metal for every man, woman and child in the nation during 1951, the American Iron & Steel Institute reports. This represents an increase of 84 pounds over 1950.

Iron and steel made up 1365 pounds of the 1951 total, 86 pounds over the preceding year, while nonferrous metals showed a decline of 2 pounds in 1951 to 60 pounds per person.

Over the period 1941-1951, steel production increased 26.9 per cent, while the four leading nonferrous metals by primary producers increased only 20.2 per cent.

Freight Car Shipments Bulking Larger
(Average Monthly Figures in Units)



In the Works: New Carbuilding Program

If steel allocations materialize, 11,000 units a month may be built from October, 1952, through June, 1954. Class I roads now own only 1,757,000 freight cars

IN THE WORKS are plans to grease the freight car building program, so that carbuilders and railroad shops can turn out 11,000 a month by next October. Only 8159 were produced in March.

Carbuilding has been an up-and-down activity ever since the end of World War II, even though transportation experts since then have been almost unanimous in pointing out that the age of the nation's freight cars is dangerously high and the number in service precariously low. In the postwar period, new car shipments hit a high of 11,910 in March, 1949, but fell to a low of 971 in April, 1950.

Up, but Not Enough—The accompanying chart shows that freight car deliveries have risen since that 1950 low, but they have exceeded 10,000 the informal target in only one month since the Korean war began. Materials shortages have kept the totals down in the past 21 months. The railroads' financing problems hobbled production in the last half of 1949 and the first six months of 1950. Now, financing problems are being ironed out and the steel shortage is easing enough to presage a marked increase in freight car production.

In July, 1950, one month after the Korean war began, the Class I railroads decided to increase freight car ownership from the 1,724,000 then in service to 1,850,000 by July 1, 1953. On Mar. 1, 1952, the roads owned only 1,757,000, an increase of merely 33,000 or 27 per cent of the programmed gain. The Defense Transport Administration has just made a new study of the situation. Based on forecasts of traffic levels, with consideration of proper retirements and new equipment necessary to alleviate shortages, the revised study indicates that Class I freight car ownership should be 1,867,000 by July 1, 1954 and all domestic freight car ownership except military and industrial should be 2,167,000.

The Target—To achieve the total of 2,167,000, carbuilders and railroad shops must turn out 272,000 cars from now until July 1, 1954. The production pace is far below that now, as are new orders. The order backlog as of Apr. 1 was only 115,854, but that's expected to improve, and production of 11,000 units a month is possible from October, 1952, through June, 1954. Defense Production Administration approves the program, and chances are good that NPA will be able to allot sufficient steel by the fourth quarter for a program that size. Carbuilders and railroad shops have the capacity for 11,000 cars a month, plus production of a relatively small number of units for the military and industry.

If the building plans go ahead, the railroads will be able to increase the rate of retirement of obsolescent units, a move long needed. Today, over one-third of our freight fleet is more than 25 years old and 18 per cent of our cars have been in service three decades or longer.

Railroads Get Full 15 per cent Freight Rate Hike

RAILROADS have been granted a 9 per cent rate increase in the South and West and a 6 per cent increase in the East. These boosts complete the 15 per cent raise the railroads wanted over the year ago level. The latest increases are estimated to bring a $678 million increase in charges. New rates will be effective May 2 on all commodities except grains which get the rise May 17.

Application for the full 15 per cent increase last year was turned down with the Interstate Commerce Commission ruling that charges should be raised only 9 per cent in the East and 6 per cent in the South and West. The new order, issued after reconsideration, allows the full 15 per cent increase across the country. It is the twelfth general rate increase allowed since the end of World War II for the railroads.

ICC said domestic water carriers may apply to their charges the same revisions authorized for the rails, terming the increases "surcharges" which will expire Feb. 28, 1954, unless continued through further action by the commission.

AISI to Meet May 21-22

Dr. Edgar C. Bain, vice president, United States Steel Co., will deliver the annual Charles M. Schwab Memorial Lecture at the American Iron & Steel Institute's general meeting in New York, May 21-22. Sessions will be held at the Waldorf-Astoria.

The institute will hold three technical sessions devoted to research, processing and open hearth, respectively. The industrial relations sessions will feature an address by Dr. Leo Wolman, professor of economics, Columbia University.

Letup on Structurals

Twice as much will be available for commercial construction in the third quarter as in this

MORE THAN twice as much structural steel for commercial construction should be available in the third quarter of this year than in the second, says DPA.

The allotment is contingent upon no further curtailment of steel production and is based upon the fact that the peak of the excessive demand for industrial expansion is being passed during this second quarter, permitting the shift to commercial building.

More for Commercial — Industrial expansion allotments will be only 183,000 tons for the third quarter as against 268,140 tons this quarter. Commercial construction will receive 40,000 tons as against 16,285 tons this quarter.

The Bureau of Public Roads will be granted 125,000 tons of structural steel for the third quarter against 80,600 in the second quarter while the Federal Security Agency's third quarter allotment for education and hospitals was increased by some 10,000 and 7,000 tons respectively from second quarter figures.

The Totals—Total allotments to the general claimant agencies of government will be 801,202 tons as compared with 718,629 tons in the second quarter. NPA industry divisions will receive 724,023 tons as compared with 766,582 in the second quarter. Grand total of steel allotments for the third quarter will be 1,656,379 tons as compared with 1,599,775 tons this quarter.

DPA administrator Manly Fleischmann says a substantial quantity of controlled materials will be made available in the fourth quarter as well for new starts in the industrial and commercial construction fields.

How J&L Met Defense Needs

You can see reflections of the defense program in Jones & Laughlin Steel Corp.'s steel shipments figures for 1950 and 1951.

Light, flat-rolled material declined in importance, while plates and structurals went up and bars remained steady.

How the company's product mix shaped up in 1951, compared with 1950, is like this:

	1951 per cent	1950 per cent
H.R. and C.R. sheets and strip	36	42
Tubular products	20	19
H.R. and C.F. bars	14	14
Tin mill products	8	9
Plates and structural shapes	12	7
Wire products	5	5
Miscellaneous	5	4
	100	100

The 1951 shipments totaled 4 million net tons, a new record. Shipments in 1950 totaled 3,844,000 tons. The 1951 figure includes 319,000 tons of products made from steel supplied by customers. In 1950, such shipments were 137,000 tons.

Three Lions

Latin American Cutlery

A stamping press at the Charles D. Briddell Co., Crisfield, Md., cuts two blanks which will eventually become machete knives, the main hand tool of Central and South American working men since the early 1800s. Made of specially rolled steel, the knives are ground to a sharpness exceeding that of an ordinary steak knife

Hardship Criteria Are Eased

Criteria for obtaining supplemental allotments of controlled materials from the Small Business Hardship Account have been liberalized for the third quarter of 1952. Continued easing of the supply of critical materials was cited by NPA and SDPA in explaining the move.

Revised criteria for the third quarter are: The firm must be a small firm as defined in the Department of Commerce "Size Study"; it must have more than 50 per cent of its actual production value in civilian-type goods; it must be unable to maintain a minimum production and supervisory staff unless it gets more materials; and it must be unable to secure other productive uses for its equipment by using substitute materials. Burden of proof for meeting the criteria rests largely on the applicant himself.

Latest to benefit under the present hardship setup are 23 producers of costume jewelry in New England. The applications were predominately for copper brass mill products and were granted in order to prevent failure or prolonged shutdown among these producers of wholly civilian goods.

Self-certification Helps

Impact of controlled materials allocations on smaller metalworking firms is minimized by increased self-certification allowances, says the Office of Small Business of National Production Authority.

In a study which covered 45 small companies in the service and household machinery industries for the second, third and fourth quarters of 1951, the OSB says it found that the curtailments due to the defense program hit the smaller companies no harder than larger ones. By permitting a manufacturer to self-certify up to 30 tons of carbon steel, 22 of the 45 companies were allowed during the fourth quarter of 1951 to use carbon steel at 100 per cent of their highest consumption for any of the first three quarters of 1951. Five companies were able to obtain more than half of their highest consumption in the same period.

The study emphasizes, says OSB, that slackening demand during last year was also a major factor in the decline in the value of shipments in the service and household machinery industries.

Defense Expansion at Mid-point

Expansion of facilities for defense production probably passed the half-way-in-place mark during the first quarter of 1952, says DPA. The estimate is based on reports from recipients of certif-

icates of necessity and covers defense expansion as a whole. Railroads, for example, were about 77 per cent in place Dec. 31, whereas aluminum expansion was only about 26 per cent in place. Steel works and rolling mills expansion was about 41 per cent in place and plants for the production of aircraft and accessories 42 per cent in place.

Machinery and equipment account for about 65 per cent of the cost of expansion assisted by certificates of necessity; construction costs 31 per cent, with 4 per cent going for land and overhead expenditures.

Expansion projects are expected to be virtually complete by the end of 1954 with 94 per cent scheduled to be in operation by the end of 1953, 63 per cent by the end of this year.

Taconite Firm Write-off O.K.'d

Taconite facilities for Erie Mining Co., Aurora, Minn., valued at over $298 million were approved for 75 per cent write-off by DPA last week. Majority of the other large certificates granted went to electric power companies as DPA whittles at the backlog of power applications pending.

Ore Season Off to Good Start

Shipments of iron ore from the upper lakes region to Canadian and U. S. ports on Apr. 14 were well ahead of year-ago figures despite one of the worst ice jams on the lower St. Mary's river in the memory of veteran marine men.

The first weekly summary of the Lake Superior Iron Ore Association reports 976,742 gross tons received during the week ended Apr. 14 and a cumulative seasonal total of 1,310,824 gross tons. This compares with 915,695 tons and 933,438 tons, respectively, in the same 1951 periods. Of the cumulative 1952 total, all but 22,993 tons went to U. S. ports.

The *Albert E. Heekin* was the first boat of the season, leaving Escanaba, Mich., on Apr. 2.

The Great Lakes ore fleet is out to break the peacetime record 89,092,012 gross tons carried last year, second only to the alltime record set in the war-year 1942. Another new alltime record set last year was 25,871,319 net tons of limestone shipped.

'Steelmaking' Center

A VILLAGE with no steel mills is the geographic center of the country's steelmaking capacity!

It's Beaverdam, Allen county, Ohio, says the American Iron & Steel Institute. This agricultural village of only a few hundred souls in northwestern Ohio took over this distinction on the basis of the nation's 1951 steelmaking capacity. The honor previously rested with Mt. Cory, 10 miles northeast of Beaverdam.

The geographic center is determined by a tons-times-miles method of computing. The effect of a given capacity is in proportion to its distance from the geographic center.

J&L Investigates Ore Deposits

Jalore Mining Co. Ltd., a subsidiary of Jones & Laughlin Steel Corp., acquired exploration options in four areas in southeastern Ontario where there is indirect evidence of possible iron ore occurrence below the surface.

Surface geophysical investigations will be carried out this summer by J&L geologists. If ore of acceptable grade and quantity is found, it will require deep-mine operations. Three of the areas are within 80 miles of Toronto. The fourth is near Kingston, Ont.

California Boom Quieting

California manufacturers expect their boom, which started soon after Korea, to level off this quarter, according to a survey of the California Manufacturers' Association. Each quarter the group conducts a poll on the outlook as compared with the same quarter the previous year. More manufacturers than in the last two and one-half years expect a reduced volume on this basis for second quarter.

The Los Angeles County Chamber of Commerce reports that industrial expansion in the county declined for the first time in over a year during February, and that valuations in new and enlarged plants were the lowest since August, 1950.

Steel Production Sets More New Records

MORE STEEL was made in March than ever before in a month.

Output of steel for ingots and castings that month in the United States totals 9,383,000 net tons, the American Iron & Steel Institute reports.

The March rate of production would yield nearly 111 million tons of ingots and steel for castings a year. The total 1951 output was 105.1 million tons. The March production was 725,790 tons higher than the revised figure for February and 247,000 tons higher than the previous monthly record, made in January, 1952.

Output in the first quarter was also a record, 27,176,327 tons. That is nearly 1.5 million tons more than in the corresponding 1951 period.

March production was at a rate of 102 per cent of capacity, compared with 100.7 per cent in February.

	OPEN-HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	No. of weeks in mos.
1952	Net tons	% of capac-ity	Net tons	% of capac-ity	Net tons	% of capac-ity	Net tons	% of capac-ity		
January	8,103,123	100.7	407,298	89.3	625,696	89.7	9,136,117	99.3	2,062,329	4.43
February	7,703,066	102.4	382,712	89.8	571,432	87.6	8,657,210	100.7	2,091,114	4.14
†March	8,386,000	104.2	379,000	83.1	618,000	88.6	9,383,000	102.0	2,118,000	4.43
†1st Qtr.	24,192,189	102.4	1,169,010	87.4	1,815,128	88.7	27,176,327	100.6	2,090,049	13.00
1951										
March	8,059,625	104.2	408,926	85.6	602,504	93.9	9,071,055	102.4	2,047,642	4.43
1st Qtr.	22,840,119	101.7	1,166,763	84.2	1,673,041	89.8	25,679,923	99.9	1,996,884	12.86

Note—The percentages of capacity operated in 1952 are calculated on weekly capacities of 1,816,637 net tons open-hearth, 102,926 net tons bessemer and 157,477 net tons electric ingots and steel for castings, total 2,077,040 net tons, based on annual capacities as of Jan. 1, 1952, as follows: Open-hearth 94,973,780 net tons; bessemer 5,381,000 net tons; electric 8,232,890 net tons; total 108,587,670 net tons. The percentages of capacity operated in 1951 are calculated on weekly capacities of 1,746,337 net tons open-hearth, 107,806 net tons bessemer, 144,891 net tons electric ingots and steel for castings, total 1,999,034 net tons, based on annual capacities as of Jan. 1, 1951, as follows: Open-hearth 91,054,020 net tons, bessemer 5,621,000 net tons, electric 7,554,630 net tons; total 104,229,650 net tons.

† Preliminary figures, subject to revision.

Up, Down for Motors

Demand for fractional horsepower motors is off, but military business is helping

FRACTIONAL horsepower motor business is falling off."

"No, it isn't. It'll probably be better this year than last."

Manufacturers of fractional horsepower motors split into two camps with these analyses of their business prospects. Actually, while production of standard fractional motors for industry continues to fall off, military business, particularly for aircraft, is more than buoying up those firms with defense contracts.

Looks Good—Current military orders are sufficient to provide production perhaps for the rest of the year for us, says R. L. Irvin, sales manager for Westinghouse Electric Co., at Lima, O. Whether military business is expected to increase or remain steady at present levels depends on how closely the individual firm follows changing military requirements. Universal Electric Co., Owosso, Mich., bases its optimistic military production outlook on the fact it has never been completely out of defense work and its developmental activity is now paying off. Besides aircraft applications, fractionals have broad defense uses in automotive, communications and electronics fields.

Most fractional horsepower motor makers believe defense work will slightly more than make up the drop in industrial business.

Different—Manufacturers whose defense work is still largely in the pending stage have a different outlook. J. T. Ryan, district sales manager, Century Electric Co., Pittsburgh, when asked if business would be better in 1952 than in 1951 said: "No, definitely no." Revival of industrial business of fractionals, for use largely in home building, farm equipment and industry expansion programs has been disappointing. A decline started late last year and, when coupled with the seasonal drop in December, really hurt firms stressing industrial applications.

Materials shortages are no longer being blamed for the slow revival. Even copper is regarded as being in "adequate supply" for some increase in production. Currently, demand is regarded as determining the level of production more completely than at any time since the war. There's a tendency on the part of customers to order less and more often, and on the part of manufacturers to eat away at backlogs and to book orders a little more freely.

Flood Victims To Get NPA Aid

Owners of homes, buildings and manufacturing plants which have sustained flood damage in the disaster states now comprising South Dakota, Iowa and Minnesota have been granted the right of self-certifying their materials requirements for repairs and rehabilitation within limits.

The limits for buildings of the factory type are 25 tons of steel, 2000 pounds of copper and 1000 pound of aluminum. Assistance to be given includes not only materials but such equipment as generators, earthmoving equipment, construction machinery, motors.

Jet Range Extenders

Jettisonable aluminum and steel fuel tanks, shown undergoing final processing at Pastushin Aviation Corp., Los Angeles, before being shipped to the Korean fighting front, fit under the wings of jet planes. The tanks extend the tactical radius of the jets and give them greater combat efficiency

Navy Procurement Installs Advisors for Small Firms

NAVY PROCUREMENT officials are scanning the horizon for more ways and means to award contracts to small business.

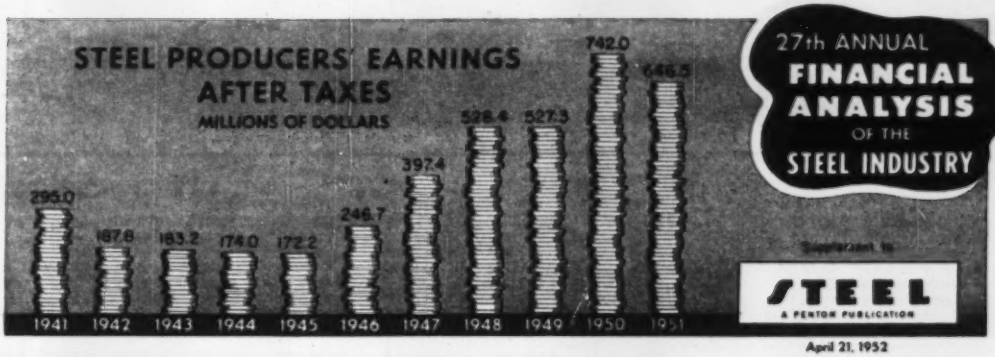
At the present time, the Navy is placing 85 advisors for small business in key cities throughout the country. These advisors are located in Naval procurement offices and Inspector of Naval Materiel offices.

From one of the advisors, a manufacturer may learn how he can use his plant for defense work or how the Navy procurement system works. The advisor has on file information on current bid invitations, informal purchases and negotiations.

Also, the small business advisor will obtain for the Navy contracting officers data on competency, capacity and credit of small firms placing bids for contracts.

Contracts awarded by the government in excess of $250,000:

PRODUCT	CONTRACTOR
Machines	Fidelity Machine Co. Inc., Philadelphia
Machines, Crank Press	V & O Press Co. Div., Rockwell Mfg. Co. Inc., Hudson, N. Y.
Machines, Carton Packer	Standard-Knapp Div., Hartford-Empire Co., Portland, Conn.
Milling Machines	Cincinnati Milling Machine Co., Cincinnati
Mills, Boring & Turning	King Machine Tool Div., American Steel Foundries, Cincinnati
Surface Grinders	Gallmeyer & Livingston Co., Grand Rapids, Mich.
Trim Presses	E. W. Bliss Co., Toledo, O.
Tractors	Caterpillar Tractor Co., Peoria, Ill.
Fork Trucks	Towmotor Corp., Cleveland
Motor Vehicle Parts	Biederman Motors Corp., Cincinnati
Actuators	Breeze Corporations Inc., Newark, N. J.
Cartridge Cases	Paloran Products Inc., New Rochelle, N. Y.
Fuzes	Masco Screw Products Co., Dearborn, Mich.
Metal Parts for Primers	Ainsworth Mfg. Corp., Detroit
Gun Tubes & Parts	General Motors Corp., Detroit
Aircraft Parts	Kindred Aviation Corp., Burbank, Calif.
Spare Parts	Clayton Mfg. Co., El Monte, Calif.
Inverters	Leland Electric Co., Dayton, O.
Generators	Jack & Heintz Precision Industries Inc., Cleveland
Test Stands	Westinghouse Electric Corp., Pittsburgh
Propeller Kit Assemblies	Sun Electric Corp., Chicago
Bomb Racks	Curtiss-Wright Corp., New York
Tank Assemblies	Ainsworth Mfg. Corp., Detroit
Telegraph Sets	Royal Heaters Inc., Alhambra, Calif.
Teletype Writer Set	North Electric Mfg. Co., Galion, O.
Transistors	Molded Insulation Co. Inc., Philadelphia
Filing Cabinets	Western Electric Co., New York
Stoves, Yukon	Browne-Morse Co., Muskegon, Mich.
X-Ray Tables	C. L. Bryant Corp., Cleveland
	Picker X-Ray Corp., New York



April 21, 1952

Record Output Couldn't Offset Blow from Taxes

THE STEEL industry turned out more steel in 1951 than in any previous year, but its net profit was lower than in 1950.

STEEL's 27th Annual Financial Analysis of the Steel Industry shows that this record production pushed up the sales and revenues of 30 companies, representing 95 per cent of the nation's steel capacity, to an alltime high that was 21.8 per cent over the 1950 total.

At the same time, their net profit dropped 12.9 per cent.

While this decline resulted from increases in various costs of operating such as rises in prices of purchased materials, freight charges and wages, a notably big factor was federal taxes, which took 60.7 per cent more from the steel producers in 1951 than in 1950. Steel prices could not be increased to offset the higher operating costs, for government controls stood in the way.

Taxes Are Double the Profits

Federal income and excess profits taxes levied on the 30 companies in 1951 amounted to twice as much as their net profits for that year. The tax bite totaled $1,222,871,705. The companies' net profits were only $646,523,384. In 1950, the tax take was only $760,924,272; the companies' net profits, $741,994,981.

The federal government, with no investment in the steel companies, got four times as much out of them in 1951 as the stockholders who have an investment at stake. Dividends on preferred and common stock that year totaled $295,753,800. The 1950 dividends total was $287,474,463.

As a result of the higher operating costs the companies' net profit per dollar of sales declined. Out of every dollar of sales in 1950 the companies were able to keep 7.99 cents as profit. In 1951 they were able to retain only 5.71 cents. This was the lowest rate since 1946 and broke a four-year string of increases.

Gains Made by 12 Companies

While the industry as a whole earned less in 1951 than in 1950, 12 of the 30 companies showed increases. Because only one of the 12 was among the ten largest companies the gains by the 12 were not sufficient to offset the declines in net earnings of the other 18 producers.

The decline in net earnings and the increase in ingot production combined to cut the net income per ton of ingots produced by 25 of the companies in 1951 to $6.38. In 1950 it was $8.00.

The federal income tax take from these 25 companies in 1951 amounted to $11.92 per ton of ingots produced.

An increase in the number of shares of common stock outstanding and the decline in net earnings reduced the net income per share of common stock, after allowance for preferred stock requirements, to an average of $6.55 for the 30 companies. The 1950 average was $8.19.

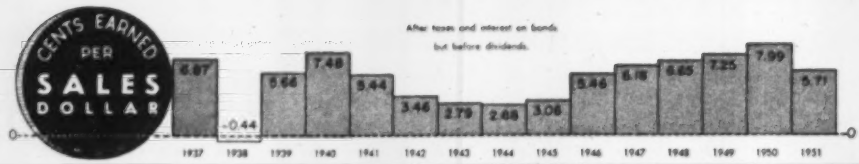
The number of outstanding shares of common stock continued in 1951 to increase through stock splits, stock dividends and issuance of additional shares. In 1951 the 30 companies had 92,473,453 shares of common outstanding, compared with 85,523,453 in 1950.

To help carry out its huge program of expansion, the steel industry had to continue its borrowing of money. Resultant was a 30 per cent increase in the long-term debt in 1951 over 1950.

Current assets and current liabilities rose in 1951 over 1950 but the rate of rise in current liabilities was greater than the rate of rise in current assets. As a result the ratio of current assets to current liabilities declined from 2.26 to 1 in 1950 to 1.94 to 1 in 1951. Working capital, the excess of current assets over current liabilities, was only slightly greater in 1951 than in 1950.

Employment Costs Rise

The continued expansion of the steel industry's capacity and production of steel at approximately 100 per cent of capacity required a 6 per cent increase in the average number of employees in 1951 over the 1950 average. The employment increase, along with higher wage rates and premium pay for overtime work in connection with capacity production, pushed employment costs in 1951 up 21 per cent over those of 1950.



	Rated Ingot Capacity, Net Tons		Ingot Production, Net Tons		Steel Operating Rate, Per Cent		Net Income Per Ton Ingots Produced	
	1951	1950	1951	1950	1951	1950	1951	1950
United States Steel Corp.	34,643,000	33,869,000	34,323,000	31,457,000	101.34	98.20	$5.37	$6.85
Bethlehem Steel Corp.	16,000,000	15,000,000	16,405,677	15,116,456	102.54	100.78	6.49	8.14
Republic Steel Corp.	9,490,000	8,967,000	9,142,096	8,551,013	101.95	98.29	6.01	7.46
Jones & Laughlin Steel Corp.	4,847,000	4,847,000	5,032,000	4,944,000	103.82	102.01	6.16	8.04
National Steel Corp.	4,750,000	4,500,000	NA	NA	NA	NA	NA	NA
Armco Steel Corp.	4,525,000	4,330,000	4,357,562	3,958,727	96.30	91.43	8.03	11.87
Youngstown Sheet & Tube Co.	4,370,000	4,250,000	4,451,854	4,124,781	104.75	101.00	6.88	9.85
Inland Steel Co.	3,750,000	3,750,000	3,837,268	3,675,707	102.33	102.82	8.96	10.34
Wheeling Steel Corp.	1,860,000	1,800,000	1,874,236	1,636,475	100.77	94.70	9.28	11.19
Colorado Fuel & Iron Corp.[4]	1,522,664	1,472,000	1,615,246	1,198,531	106.08	81.42	6.43	3.68
Sharon Steel Corp.	1,550,000	1,441,400	1,600,205	1,448,978	103.24	100.53	5.54	6.41
Kaiser Steel Corp.[5]	1,380,000	1,128,000	1,217,196	1,101,961	101.43	104.60	6.17	10.84
Crucible Steel Co. of America	1,198,960	1,153,455	NA	NA	NA	NA	NA	NA
Pittsburgh Steel Co.	1,072,000	1,072,000	1,091,364	1,074,340	100.81	100.22	6.72	5.91
Barium Steel Corp.	893,000	893,000	627,220	471,095	70.24	54.00	[20]	[20]
Allegheny Ludlum Steel Corp.	817,200	832,360	817,058	701,569	99.98	85.50	10.81	13.99
Granite City Steel Co.	720,000	620,000	746,911	681,510	103.74	109.92	6.88	8.40
Newport Steel Corp.[6]	704,700	704,700	540,824	439,937	76.75	62.43	4.05	2.99
Lukens Steel Co.[7]	675,000	675,000	686,083	621,761	101.64	92.11	5.17	3.09
Detroit Steel Corp.	660,000	660,000	644,788	653,983	97.70	99.09	16.31	13.67
Alan Wood Steel Co.	625,000	550,000	623,232	485,607	99.72	88.29	3.70	5.24
Copperweld Steel Co.	554,400[19]	554,400[19]	[18]	[18]	[18]	[18]	[18]	[18]
McLouth Steel Corp.	550,000	420,000	NA	NA	NA	NA	NA	NA
Rotary Electric Steel Co.	425,000	425,000	372,146	382,764	87.56	90.06	6.67	5.62
Laclede Steel Co.	410,000	397,845	389,662	360,668	95.04	90.66	7.18	8.93
Keystone Steel & Wire Co.	400,000	325,000	323,956	342,489	99.68	105.38	14.58	18.91
Continental Steel Corp.	394,000	393,765	363,484	372,138	92.25	94.51	4.21	7.15
Northwestern Steel & Wire Co.[8]	321,000	321,000	338,690	282,974	105.51	88.15	8.61	8.54
Midvale Co.	274,654	417,624	119,902	51,420	43.66	12.31	13.51	0.99
Carpenter Steel Co.[4]	85,805	85,805	70,863	51,569	82.59	60.10	55.24	56.39
Total (or average)	99,478,383	95,855,354	91,612,528	84,187,453	99.12	94.35	$6.38	$8.00

	Number of shares of Common Stock Outstanding		Common Stock Valuation		Preferred Stock Valuation	
	1951	1950	1951	1950	1951	1950
United States Steel Corp.	26,109,756	26,109,756	$870,325,200	$870,325,200	$360,281,100	$360,281,100
Bethlehem Steel Corp.	9,582,942	9,582,942	303,459,830	303,459,830	93,388,700	93,388,700
Republic Steel Corp.	5,896,719	5,896,719	135,979,066	135,979,066	28,204,300	28,204,300
Jones & Laughlin Steel Corp.	6,200,654	6,200,327	62,007,000	103,937,000	29,357,000	29,357,000
National Steel Corp.	7,362,045	7,362,045	73,620,450	73,620,450	None	None
Armco Steel Corp.	5,214,997	3,954,333	52,149,966	39,543,331	[9]	18,234,400
Youngstown Sheet & Tube Co.	3,350,016	3,350,016	105,088,053	105,088,053	None	None
Inland Steel Co.	4,899,315	4,899,315	62,500,000	62,500,000	None	None
Wheeling Steel Corp.	1,423,897	1,423,897	37,021,322	37,021,322	35,752,600[10]	36,143,600[10]
Colorado Fuel & Iron Corp.[4]	2,000,523	1,191,096	10,003,216	5,955,480	None	8,587,929
Sharon Steel Corp.	1,100,000	925,863	11,060,390	9,319,020	None	None
Kaiser Steel Corp.[5]	3,200,000	1,000	3,200,000	100,000	40,000,000	None
Crucible Steel Co. of America	574,362	488,680	14,359,044	12,216,998	30,527,200	31,057,400
Pittsburgh Steel Co.	1,091,915	931,048	8,819,355	7,044,845	24,194,300	12,026,500
Barium Steel Corp.	2,230,910	2,223,402	2,230,910	2,223,402	None	None
Allegheny Ludlum Steel Corp.	1,627,169	1,320,651	10,169,806	8,254,069	8,134,600	10,028,500
Granite City Steel Co.	1,278,462[14]	497,201	15,980,775	11,027,243	10,226,500	None
Newport Steel Corp.[6]	1,078,547	1,078,535	1,078,547	1,078,535	None	None
Lukens Steel Co.[7]	317,976	317,976	3,179,760	3,179,760	None	None
Detroit Steel Corp.	1,185,793	1,185,793	1,185,793	1,185,793	None	None
Alan Wood Steel Co.	594,107	562,202	5,941,070	5,622,020	6,525,000	6,750,000
Copperweld Steel Co.	514,864	514,864	2,574,320	2,574,320	1,065,000	1,141,500
McLouth Steel Corp.	951,680	951,680	2,379,200	2,379,200	None	None
Rotary Electric Steel Co.	290,413	193,676	2,904,130	1,936,760	None	None
Laclede Steel Co.	206,250	206,250	4,125,000	4,125,000	None	None
Keystone Steel & Wire Co.	1,875,000	1,875,000	2,604,167	2,604,167	None	None
Continental Steel Corp.	501,361	501,361	7,018,789	7,018,789	None	None
Northwestern Steel & Wire Co.[8]	817,825	817,825	4,089,125	4,089,125	None	None
Midvale Co.	600,000	600,000	10,574,621	10,574,621	None	None
Carpenter Steel Co.[4]	395,955	360,000	1,979,775	1,800,000	99,215	None
Total (or average)	92,473,453	85,523,453	$1,827,608,680	$1,835,783,399	$667,755,515	$635,200,929

Boldface type is used under those columns in which figures from all 30 companies were not available. NA = Not Available.

[1] Excluding amount maturing within one year.

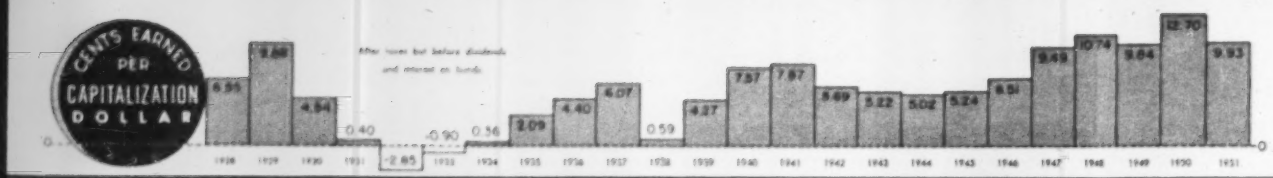
[2] After income taxes.

[3] Including funded debt due within one year.

[4] Fiscal years ended June 30.

[5] Corporation publicly refinanced Nov. 1, 1950. Figures shown are for fiscal years ended June 30.

[6] Fiscal years ended Oct. 31.



THIS SPECIAL REPORT is com
senting 95.4 per cent of the

Net Income Per Ton Ingot Capacity 1951	1950	Capitalization Per Ton Ingot Capacity 1951	1950	Average Number Employed 1951	1950	Total Payrolls 1951	1950	Funded Debt[1] 1951	1950	Surplus 1951	1950	Total Capitalization 1951	1950	Provision F Depreciation, De 1951	
$5.32	$6.36	$62.09	$61.32	301,328	288,265	$1,244,995,660	$1,038,298,489	$ 54,879,636	$ 61,782,446	$865,372,544	$784,561,702	$2,150,858,480	$2,076,950,448	$162,091,475	$1
6.66	8.20	68.37	65.18	154,589	138,483	624,091,687	494,738,478	220,314,000	166,064,000	476,763,402	414,796,647	1,093,925,932	977,709,177	45,891,869	
6.12	7.33	62.77	59.51	69,545	67,079	298,650,689	247,153,395	141,209,110	47,461,903	257,437,419	227,794,948	562,829,895	439,440,217	24,799,375	
6.40	8.20	95.57	77.83	43,622	42,897	184,293,000	158,685,000	115,128,000	71,771,000	256,727,000	172,171,000	463,219,000	377,236,000	25,695,000	
9.53	12.85	74.64	73.57	29,933	29,679	140,555,562	124,135,529	40,000,000	40,000,000	241,365,705	218,108,598	354,558,375	331,066,167	21,898,468	
7.74	10.85	74.87	66.73	28,157	27,479	127,462,039	111,954,462	59,096,995	60,920,000	227,541,137	170,246,663	338,788,098	288,944,394	14,228,709	
7.21	9.95	81.38	71.00	26,141	26,001	111,295,000	94,261,000	52,000,000	28,500,000	188,762,146	168,167,993	345,850,199	301,756,046	13,702,863	
9.17	10.63	77.57	77.10	26,327	25,483	119,750,847	102,198,141	67,250,000	69,250,000	161,132,261	143,881,279	290,882,261	275,631,279	8,753,246	
9.35	10.60	103.60	94.24	15,434	15,598	75,425,475	66,907,861	50,912,900	38,812,000	69,016,692	57,646,244	192,703,514	169,623,166	6,704,396	
6.82	2.99	63.63	55.97	16,857	13,963	61,688,239	43,689,326	22,337,500	14,437,500	64,541,572	53,402,257	96,882,288	82,383,166	3,913,896	
5.72	6.44	44.06	38.61	10,172	9,850	44,254,854	36,268,202	8,850,000	8,500,000	46,386,036	37,827,943	68,296,426	55,646,963	2,603,485	
5.44	10.59	125.24	113.97	6,699	4,686	28,204,966	18,343,748	85,000,000	92,139,523	44,634,377	44,627,536	172,834,377	136,867,059	5,943,760	
6.98	5.47	88.14	82.46	16,214	14,558	68,290,000	54,091,000	26,405,000	22,345,000	34,384,522	29,491,047	105,675,766	95,110,445	4,566,777	
6.84	5.92	75.74	55.09	9,607	8,964	45,231,178	38,288,216	9,287,989	5,513,908	38,892,051	34,468,851	81,193,695	59,054,104	2,121,594	
[2]	[2]	[2]	[2]	6,000	5,000	NA	NA	None	None	16,114,783	12,810,741	18,345,693	15,034,143	1,027,883	
10.81	11.79	116.75	80.71	15,058	13,247	65,250,310	52,215,082	22,170,000	6,480,000	54,936,367	42,419,011	95,410,773	67,181,580	3,479,703	
7.14	9.24	79.52	51.84	4,433	3,330	18,787,273	12,596,544	12,003,125	5,133,333	19,045,970	15,977,196	57,256,370	32,137,772	2,220,816	
3.10	1.87	30.80	30.68	3,837	4,089	14,422,243	13,969,934	1,806,280	3,151,695	18,820,455	17,387,366	21,705,283	21,617,596	996,221	
5.26	2.85	37.23	35.22	5,079	4,255	21,891,157	16,135,126	1,955,000	2,870,000	19,995,764	17,721,101	25,130,524	23,770,861	1,749,872	
15.93	13.55	71.44	60.69	5,068	5,110	21,028,925	18,787,314	13,425,000	14,475,000	32,540,514	24,397,204	47,151,307	40,057,997	1,077,721	
3.69	4.63	47.17	52.13	3,547	3,461	14,573,492	12,075,299	4,982,000	5,617,000	12,033,917	10,679,808	29,481,987	28,668,828	2,501,941	
[3]	[3]	[3]	[3]	3,507	3,062	16,012,157	12,856,607	1,638,000	1,710,000	14,780,729	13,316,680	20,058,049	18,742,500	855,836	
9.37	13.71	58.46	77.72	1,853	1,622	NA	NA	11,593,779	17,233,779	18,178,841	13,027,803	32,151,820	32,640,782	3,428,878	
5.84	5.06	32.75	25.54	943	785	5,837,834	4,423,445	1,500,000	2,000,000	9,514,963	6,919,348	13,919,093	10,856,108	686,602	
6.82	8.10	39.74	36.97	2,796	2,713	11,403,677	9,540,808	1,902,542	2,042,313	10,265,156	8,539,658	16,292,698	14,706,971	870,406	
14.54	19.93	52.35	59.13	2,230	2,203	10,939,778	10,795,532	None	None	18,336,154	16,611,868	20,940,321	19,216,035	570,808	
3.88	6.76	41.84	40.59	2,663	2,633	11,199,536	10,113,254	None	None	9,467,646	8,965,065	16,486,435	15,983,854	602,361	
9.08	7.53	38.48	28.59	2,394	2,255	9,970,864	8,411,322	None	None	8,261,712	5,088,273	12,350,837	9,177,398	566,214	
5.90	0.12	63.16	39.09	2,400	1,700	9,920,134	6,244,235	None	None	6,772,076	5,751,568	17,346,697	16,326,189	547,000	
45.62	33.89	237.53	198.78	3,171	2,833	14,230,000	10,278,473	None	None	17,875,774	14,653,870	20,380,848	17,054,829	397,104	
$6.50	$7.74	$68.80	$63.73	819,595	771,283	$3,419,656,576	$2,827,455,822	$1,025,646,856	$788,210,400	$3,259,897,685	$2,791,459,248	$6,782,907,041	$6,050,592,074	$364,494,279	$32

Book Value Per Share of Common Stock 1951	1950	Number of Common Stockholders 1951	1950	Number of Preferred Stockholders 1951	1950	Preferred Dividend Requirements 1951	1950	Net Earnings Per Common Share 1951	1950	Dividends Per Share on Preferred 1951	1950	Dividends Per Share on Common 1951	1950	Normal Federal Income Taxes 1951	1950	Federal Excess Profits Tax 1951	1950
$66.48	$63.38	210,743	197,778	72,733	74,119	$25,219,677	$25,219,677	$6.10	$7.29	$7.00	$7.00	$3.00	$3.55	$308,000,000	$203,000,000	$90,000,000	$31,000,000
81.42	74.95	78,670	75,972	22,792	23,427	6,537,209	6,537,209	10.43	12.15	7.00	7.00	4.00	4.10	136,000,000	107,000,000	26,000,000	15,000,000
66.72	61.69	57,600	56,255	7,629	7,872	1,692,258	1,692,258	9.03	10.53	6.00	6.00	4.00	4.25	88,500,000	65,800,000	29,000,000	13,400,000
51.40	106.18	35,882	23,256	6,305	6,364	1,468,000	1,468,000	4.76	14.72	5.00	5.00	1.80	2.75	44,643,000	29,380,000	9,696,000	4,470,000
42.75	39.57	NA	NA	None	None	None	None	6.15	7.85	None	None	3.00	2.85	74,550,000	52,800,000	20,450,000	8,300,000
53.65	53.08	50,174	40,202	None	4,918	139,570	880,609	6.69	11.76	1.125	4.50	3.00	4.00	54,100,590	40,248,159	15,040,702	7,925,069
87.72	81.56	14,439	13,203	None	None	None	None	9.15	12.12	None	None	3.00	3.00	34,372,000	30,535,000	4,320,000	3,285,000
45.65	42.12	15,250	14,722	None	None	None	None	7.02	7.76	None	None	3.50	3.50	43,030,000	35,559,700	10,490,000	5,665,000
74.47	66.48	7,024	5,944	4,503	4,459	1,787,630	1,807,180	10.96	11.59	5.00	5.00	3.00	1.95	25,817,000	15,300,425	7,845,000	2,023,000
37.26	49.85	10,416	6,250	None	5,050	None	477,127	5.06	3.30	0.881	1.00	1.875	1.50	14,402,300	2,704,300	4,534,200	None
54.04	50.92	8,080	5,314	None	None	None	None	8.06	10.03	None	None	3.50	3.08	13,900,000	8,100,000	4,580,000	1,520,000
14.95	447.28	15,500	1	15,500	None	1,550,844	None	1.86	[5]	0.969	None	None	[5]	6,690,017	8,100,000	None	None
84.87	85.55	3,390	3,124	7,043	6,715	1,530,844	1,552,855	11.89	9.73	5.00	6.25	None	None	13,414,770	6,821,436	4,684,651	1,379,087
43.70	41.24	3,502	2,057	3,342	1,838	791,309	647,530	5.99	6.13	5.50[11]	5.50[11]	[12]	None	12,271,000	5,560,000	3,800,000	950,000
8.22	6.76	12,000	12,000	None	None	None	None	1.87	0.66	None	None	0.40	None	6,780,674	1,752,942	1,885,000	312,000
40.01	38.37	13,753	12,602	2,534	2,267	42,958[13]	476,454	5.40	7.07	0.53[13]	4.50	2.50	2.50	15,050,000	8,700,000	5,140,000	1,550,000
27.40[14]	54.31	5,153	2,770	1,888	None	31,250[15]	None	4.00[14]	11.52	None	None	2.20	4.25	6,535,000	4,685,000	1,445,000	735,000
18.45	17.12	5,937	5,958	None	None	None	None	2.03	1.22	None	None	0.70	None	3,043,196	1,051,810	840,000	None
72.89	65.73	1,331	1,454	None	None	None	None	11.16	6.04	None	None	4.00	1.95	6,600,000	1,505,834	2,205,500	None
28.44	21.57	2,062	2,063	None	None	None	None	8.87	7.54	None	None	2.00	2.00	16,332,229	7,105,771	5,480,000	1,510,000
30.26	29.00	1,113	1,072	624	663	329,062	340,908	3.32	3.92	5.00	5.00	1.40	0.60[16]	3,530,000	1,745,000	662,000	None
33.71	30.86	3,716	3,329	446	461	54,470	58,033	5.14	4.88	2.50	2.50	2.30	2.00	4,360,000	1,800,000	1,150,000	None
21.60	16.19	1,350	1,093	None	None	None	None	5.41	6.05	None	None	None	[17]	8,410,000	4,585,000	2,930,000	855,000
42.79	45.73	841	749	None	None	None	None	8.55	11.10	None	None	2.75	2.00	3,755,000	1,688,000	1,260,000	222,000
69.77	61.40	1,237	1,183	None	None	None	None	13.57	15.62	None	None	5.20	5.40	4,090,000	2,841,900	985,000	360,453
11.17	10.25	3,866	3,559	None	None	None	None	2.52	3.45	None	None	1.60	2.05	5,046,435	4,880,277	1,084,405	729,444
32.88	31.88	2,805	2,673	None	None	None	None	3.05	5.31	None	None	2.05	3.30	3,085,000	3,220,000	1,065,000	None
15.10	11.22	920	950	None	None	None	None	3.56	2.95	None	None	None	None	2,883,700	1,590,000	703,000	None
28.91	27.21	NA	NA	None	None	None	None	2.70	0.09	None	None	1.00	None	None	None	None	None
51.47	43.07	2,950	2,780	None	None	None	None	9.89	7.34	None	None	1.50[21]	4.00[21]	4,900,384	1,672,665	1,503,952	None
		569,704	498,313	145,339	138,153	$41,175,081	$41,157,840	$6.55	$8.19					$964,092,295	$659,733,219	$258,779,410	$101,191,053

[1] Fiscal years were 52 weeks ended Oct. 27, 1951 and Oct. 28, 1950.
[2] Fiscal years ended July 31.
[3] 150,000 shares of $100 par value each authorized; none outstanding.
[4] After preferred stock in treasury: 1951, 5,640 shares at cost value of $511,122; 1950, 1,730 shares at cost value of $159,324.
[5] Payment on prior preferred; payment on class A preferred $55.625 per share in 1951, $5.00 in 1950. Class B stock retired in 1951.

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[12] Stock dividend of 2 per cent declared in 1951.
[13] In addition, $4.50 cumulative preferred stock outstanding was called in January, 1951. The $4.375 preferred stock was issued in November, 1951.
[14] Common stock split two-for-one Mar. 15, 1951.

T is compiled from data from 30 producers repre-
t of the steelmaking capacity in the United States

Financial Analysis

OF THE STEEL INDUSTRY FOR 1951

Provision For reciation, Depletion 1950	Total Income Before Dividends and Interest on Bonds[1] 1951	1950	Total Income—Per Cent of Capitalization 1951	1950	Net Sales 1951	1950	Net Profit—Per Cent of Net Sales 1951	1950	Net Income Before Dividends 1951	1950	
1,475	$143,938,940	$186,329,413	$217,635,283	8.66	10.48	$3,524,121,226	$2,956,406,146	5.23	7.29	$184,359,787	$215,464,142	United States Steel Corp.
1,869	35,695,998	112,197,080	127,931,459	10.26	13.08	1,799,506,346	1,445,404,331	5.92	8.51	106,531,293	122,976,071	Bethlehem Steel Corp.
9,375	29,221,782	57,693,828	65,496,449	10.25	14.90	1,052,715,386	881,753,328	5.22	7.23	54,921,541	63,794,711	Republic Steel Corp.
5,000	20,727,000	33,700,000	41,558,000	7.28	11.02	564,330,000	487,451,000	5.49	8.15	30,998,000	39,744,000	Jones & Laughlin Steel Corp.
8,468	20,002,683	46,544,236	59,072,117	13.13	17.84	618,461,408	537,024,673	7.32	10.77	45,287,093	57,814,974	National Steel Corp.
8,709	10,786,763	36,869,765	48,944,303	10.88	16.94	534,834,687	439,296,931	6.54	10.70	35,004,487	47,000,505	Armco Steel Corp.
2,863	12,457,522	31,890,884	41,441,403	9.85	14.42	489,305,162	409,898,010	6.26	9.91	30,644,201	40,616,403	Youngstown Sheet & Tube Co.
3,246	9,042,156	36,310,738	39,960,038	12.48	14.50	521,449,655	461,376,600	6.60	8.24	34,398,585	38,015,676	Inland Steel Co.
4,396	6,423,727	19,088,896	19,700,011	9.91	11.61	229,012,621	186,723,442	7.59	9.81	17,392,959	18,314,517	Wheeling Steel Corp.
3,896	3,436,047	10,969,697	4,894,226	11.32	5.94	191,444,412	112,642,939	5.42	3.91	10,382,228	4,406,226	Colorado Fuel & Iron Corp.[4]
3,485	2,469,755	9,137,596	9,573,329	13.38	17.20	169,961,946	136,120,769	5.21	6.82	8,861,187	9,284,643	Sharon Steel Corp.
3,760	4,897,979	10,236,561	15,643,010	5.92	11.43	100,471,475	85,480,816	7.48	14.08	7,510,561	11,940,563	Kaiser Steel Corp.[5]
5,777	4,207,299	9,290,877	7,074,255	8.79	7.44	202,868,727	147,807,941	4.12	4.27	8,363,225	6,311,254	Crucible Steel Co. of America
1,594	1,777,944	7,480,059	6,575,336	9.21	11.13	150,462,914	119,185,237	4.87	5.33	7,331,599	6,350,410	Pittsburgh Steel Co.
7,883	1,003,713	4,164,177	1,474,226	22.70	9.81	91,642,638	53,523,876	4.54	2.75	4,164,177	1,474,226	Barium Steel Corp.
9,703	2,752,814	8,834,140	9,814,891	9.26	14.61	229,090,224	177,961,693	3.86	5.52	8,834,140	9,814,891	Allegheny Ludlum Steel Corp.
0,816	1,378,270	5,142,520	5,727,406	8.98	17.82	86,773,193	60,234,843	5.93	9.51	5,142,520	5,727,406	Granite City Steel Co.
5,221	1,117,804	2,292,100	1,481,689	10.56	[6] 6.85	59,524,505	51,699,206	3.68	2.55	2,188,023	1,317,049	Newport Steel Corp.[6]
9,872	1,490,878	3,667,346	2,067,214	14.59	8.69	80,546,418	52,935,861	4.41	3.63	3,549,567	1,922,037	Lukens Steel Co.[7]
7,721	1,069,118	11,069,211	9,328,568	23.48	23.29	113,747,044	92,949,234	9.24	9.62	10,514,896	8,943,140	Detroit Steel Corp.
1,941	1,747,233	2,591,771	2,861,349	8.79	9.98	58,764,602	44,954,826	3.92	5.67	2,303,720	2,546,902	Alan Wood Steel Co.
5,836	652,829	2,775,165	2,605,739	13.84	13.90	76,185,026	55,596,047	3.55	4.63	2,703,165	2,572,539	Copperweld Steel Co.
4,878	1,875,099	5,151,038	5,757,342	16.02	17.64	NA	NA	NA	NA	5,151,038	5,757,342	McLouth Steel Corp.
3,602	433,353	2,482,974	2,150,170	17.84	19.81	40,714,531	31,103,586	6.10	6.91	2,482,974	2,150,170	Rotary Electric Steel Co.
9,406	684,573	2,863,032	3,291,539	17.57	22.36	47,657,001	39,615,464	5.87	8.13	2,797,998	3,222,475	Laclede Steel Co.
9,808	525,493	4,724,286	6,477,387	22.56	33.71	44,406,154	43,206,187	10.64	14.99	4,724,286	6,477,387	Keystone Steel & Wire Co.
2,361	601,507	1,530,371	2,660,153	9.28	16.64	39,866,978	36,428,123	3.84	7.30	1,530,371	2,660,153	Continental Steel Corp.
3,214	249,306	2,915,271	2,416,222	23.60	26.33	42,981,692	31,670,308	6.78	7.63	2,915,271	2,416,222	Northwestern Steel & Wire Co.[8]
7,000	384,000	1,619,925	51,143	9.34	0.31	23,797,334	11,394,397	6.81	0.45	1,619,925	51,143	Midvale Co.
7,104	391,596	3,914,567	2,907,774	19.21	17.05	44,142,214	25,956,366	8.87	11.20	3,914,567	2,907,774	Carpenter Steel Co.[4]
1,279	$321,443,181	$673,477,524	$766,572,031	$9.53	$12.26	$11,228,785,519	$9,215,802,220	5.71	7.99	$646,523,384	$741,994,981	Total (or average)

ross ax 1950	Total Assets 1951	1950	Current Assets 1951	1950	Current Liabilities[2] 1951	1950	Ratio of Current Assets to Current Liabilities 1951	1950	Working Capital 1951	1950	
31,000,000	$3,140,678,992	$2,829,186,168	$1,212,720,207	$1,079,338,746	$877,802,623	$637,520,293	1.38—1	1.69—1	$334,917,584	$441,818,453	United States Steel Corp.
15,000,000	1,541,687,919	1,314,266,856	873,130,162	699,988,462	408,761,987	298,807,679	2.14—1	2.34—1	464,368,175	401,180,783	Bethlehem Steel Corp.
13,400,000	691,682,832	552,077,875	274,735,190	257,905,476	110,453,613	94,492,805	2.49—1	2.73—1	164,281,577	163,412,671	Republic Steel Corp.
4,470,000	592,034,000	466,322,000	219,534,000	208,118,000	125,987,000	85,358,000	1.74—1	2.44—1	93,547,000	122,760,000	Jones & Laughlin Steel Corp.
8,300,000	452,884,792	419,808,189	223,680,937	219,994,188	64,855,385	58,703,383	3.45—1	3.75—1	158,825,552	161,290,805	National Steel Corp.
7,925,069	416,014,518	372,120,519	189,779,933	186,904,543	70,766,626	77,702,484	2.68—1	2.41—1	119,013,307	109,202,059	Armco Steel Corp.
3,285,000	439,097,395	381,896,152	260,625,990	248,855,884	83,312,419	70,939,782	3.13—1	3.51—1	177,313,571	177,916,102	Youngstown Sheet & Tube Co.
5,665,000	381,463,354	356,465,586	193,770,730	197,596,157	81,377,640	69,860,014	2.38—1	2.83—1	112,393,090	127,736,143	Inland Steel Co.
2,023,000	214,921,421	190,801,447	96,012,927	78,764,860	17,248,229	16,314,815	5.57—1	4.83—1	78,764,698	62,450,045	Wheeling Steel Corp.
None	139,961,591	102,250,338	67,917,406	45,023,240	37,694,732	16,031,277	1.80—1	2.81—1	30,222,674	28,991,963	Colorado Fuel & Iron Corp.[4]
1,520,000	90,307,006	72,465,756	59,768,533	48,077,116	21,500,580	16,068,793	2.78—1	2.99—1	38,267,953	32,008,323	Sharon Steel Corp.
None	190,379,707	155,712,014	61,417,458	27,576,029	17,322,576	18,680,160	3.55—1	1.48—1	44,094,882	8,895,869	Kaiser Steel Corp.[5]
1,379,087	131,987,086	120,097,495	59,926,274	57,842,047	23,669,530	22,040,415	2.53—1	2.62—1	36,256,744	35,801,632	Crucible Steel Co. of America
950,000	112,808,642	78,170,737	63,932,306	41,741,436	31,259,647	17,160,290	2.05—1	2.43—1	32,672,659	24,581,146	Pittsburgh Steel Co.
312,000	43,239,784	32,123,125	26,024,526	16,220,720	19,067,101	11,347,562	1.36—1	1.43—1	6,957,425	4,873,158	Barium Steel Corp.
1,550,000	126,096,063	95,192,254	63,767,592	56,159,740	28,580,582	26,170,103	2.23—1	2.15—1	35,187,010	29,989,637	Allegheny Ludlum Steel Corp.
735,000	77,976,028	44,229,179	40,639,244	26,516,615	19,648,794	11,340,407	2.07—1	2.34—1	20,990,450	15,176,208	Granite City Steel Co.
None	32,799,863	29,598,776	18,562,450	15,358,077	9,094,423	5,981,028	2.04—1	2.57—1	9,468,027	9,377,049	Newport Steel Corp.[6]
None	43,911,091	31,423,862	32,592,784	21,111,834	18,694,748	6,810,273	1.74—1	3.10—1	13,898,036	14,301,561	Lukens Steel Co.[7]
1,510,000	81,279,391	57,651,187	48,751,722	32,124,481	34,128,084	17,241,727	1.43—1	1.87—1	14,623,638	14,882,754	Detroit Steel Corp.
None	39,320,684	35,801,254	13,974,773	12,390,719	9,234,341	6,534,881	1.51—1	1.90—1	4,740,432	5,855,838	Alan Wood Steel Co.
None	29,183,826	25,653,651	18,454,317	16,328,463	8,841,547	6,449,770	2.19—1	2.53—1	9,612,770	9,878,693	Copperweld Steel Co.
855,000	53,866,769	45,490,508	29,229,030	19,240,686	21,714,948	12,849,726	1.35—1	1.50—1	7,514,082	6,390,960	McLouth Steel Corp.
222,000	16,131,141	12,956,394	6,204,363	4,394,222	2,212,048	2,100,286	2.80—1	2.09—1	3,992,315	2,293,936	Rotary Electric Steel Co.
360,453	22,027,116	19,117,241	12,548,541	11,302,557	5,434,418	4,160,270	2.31—1	2.72—1	7,114,123	7,142,287	Laclede Steel Co.
729,444	23,561,289	23,143,219	9,715,787	10,997,106	2,620,968	3,756,236	3.71—1	2.93—1	7,094,819	7,240,870	Keystone Steel & Wire Co.
None	21,396,048	19,229,682	9,465,273	7,982,077	4,139,256	2,574,289	2.29—1	3.10—1	5,326,017	5,407,788	Continental Steel Corp.
None	25,166,255	13,470,209	8,980,103	6,958,641	8,923,898	3,510,037	1.01—1	1.98—1	56,205	3,448,604	Northwestern Steel & Wire Co.[8]
None	21,462,339	18,258,496	14,040,438	11,562,219	3,659,716	1,700,136	3.84—1	6.80—1	10,380,722	9,862,083	Midvale Co.
None	30,736,008	21,930,857	24,474,564	15,955,188	10,350,888	4,871,387	2.36—1	3.28—1	14,123,676	11,083,801	Carpenter Steel Co.[4]
91,191,053	$9,224,062,950	$7,936,911,026	$4,234,377,560	$3,682,329,535	$2,178,358,347	$1,627,078,308	1.94—1	2.26—1	$2,056,019,213	$2,055,251,221	Total (or average)

anding was
ock was is-

[1] Preferred dividends payable from Dec. 19, 1951 to Dec. 31, 1951, 5.5 per cent on $10,226,500.
[2] In addition to one 5 per cent stock dividend.
[3] Stock dividend of 100 per cent issued Sept. 29, 1950.
[4] Comparisons would be misleading as company's operations include a wire and cable division with no steel ingot capacity.
[5] Represents ingot capacity of steel plant only.
[6] Not applicable to company's operations.
[7] Difference between two years due to timing of declaration dates; $3.00 per share paid out of earnings for each fiscal year. In addition, 5 per cent stock dividend declared June 28, 1951 and 10 per cent stock dividend declared June 29, 1950.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

AUTO WRECKERS—Direction 1 to NPA Order M-92 exempts until further notice auto wreckers in the states of Washington, Oregon, Idaho and Montana from requirements to demolish a certain number of motor vehicles for iron and steel scrap. The three major consumers of scrap from those states have adequate scrap inventories now. Direction 1 was effective Apr. 14, 1952.

CONSUMER DURABLES — Amendment of Apr. 15, 1952, of NPA Order M-47B gives makers of consumer durable goods additional flexibility in shifting allotted materials from a product in falling demand to one in rising demand.

CRYOLITE—Amendment of Apr. 15, 1952, of NPA Order M-99 requires users of cryolite to report by the end of April, 1952, their stocks, receipts and consumption of cryolite and the end use for which it was purchased. This information will be used to determine whether cryolite should be put under complete allocation in May.

Controlled Materials Plan

STEEL EMBARGO—On Apr. 11, 1952, the NPA revoked Direction 10 and Direction 10A to CMP Regulation 1. These directions concerned embargo of steel shipments from mills and warehouses during the recent steel strike threat.

Price Regulations

TUNGSTEN—Amendment of Apr. 11, 1952, of Supplementary Regulation 42 to the General Ceiling Price Regulation was issued to indicate clearly that SR 42 covers specialty alloys containing tungsten as well as high speed tool steels and specialty steels containing tungsten. SR 42 was effective Apr. 16, 1952.

LOSSES — Amendment 4 to General Overriding Regulation 10 permits manufacturers operating at an overall loss because of a decrease in production to below normal economical capacity to apply for an upward adjustment of ceiling prices. Amendment 4 was effective Apr. 19, 1952.

Appointments in Washington

Maj. Gen. Frederick R. Dent, until recently in command of Air Force's Wright Air Development Center was appointed military director of production and requirements, Munitions Board. He replaces Maj. Gen. Francis H. Griswold, slated to command the Third Air Force, United States Air Forces in Europe.

Brig. Gen. Thomas B. McDonald, now commanding general of Middletown, Pa., Air Materiel Area, was appointed assistant for material, Office of Deputy Chief of Staff for Materiel, Air Force. He replaces Brig. Gen. Paul E. Russtow, assigned to command the Far East Materiel Command.

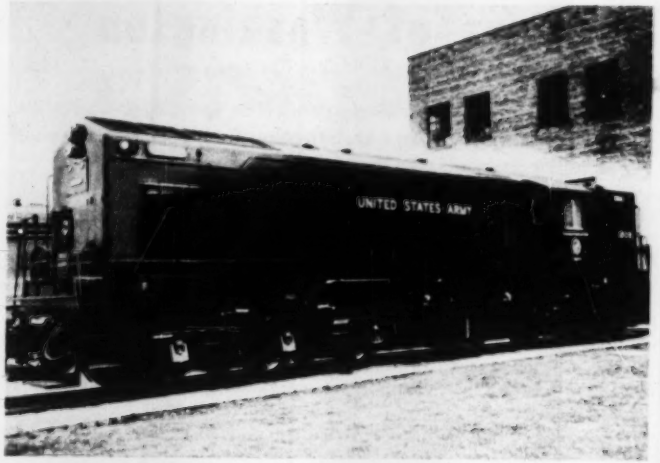
Col. Emerson B. Itschner is the new North Pacific Division Engineer, Army Engineer Corps, Portland, Oreg. He succeeds Brig. Gen. Orville E. Walsh, supervisor of the new Mediterranean Division.

Richard W. Rogers of Norfolk, Va., chief mechanical officer of the Seaboard Air Line Railroad for the past five years, was appointed director of the Railroad Equipment Division, National Production Authority.

Alan A. Cullman, controller for the Columbia Gas System Service Corp., New York, was appointed deputy director of the Gas Planning Division, Petroleum Administration for Defense.

Virgil F. Bowyer, special executive representative for The Peoples Natural Gas Co., Pittsburgh was appointed assistant director of Natural Gas Production & Processing Division, Petroleum Administration for Defense.

Monroe F. Cockrell, vice president of the Continental Illinois National Bank & Trust Co. of Chicago, was appointed chairman of the Chicago Regional Renegotiation Board. Raymond W. Ruddon, who was assigned temporarily as acting chairman of the Chicago Board, has returned to his position in Washington as special assistant to Renegotiation Board member, Frank L. Roberts.



Army MRS-1: Jack of All Tracks

The first of 13 new-type diesel locomotives designated MRS-1 was delivered to the Army Transportation Corps by Electro-Motive Division of General Motors. Its adjustable axles enable it to operate on almost any track except narrow gage. It withstands almost every kind of weather and can use lowest grades of diesel fuel oil. Though of new design, it is made of standard parts and assemblies

Petroleum Priorities Oil Ways

Private oil and gas expansion projects to cost $3.5 billion had received priorities assistance in completion or construction from Petroleum Administration for Defense as of Mar. 28. An additional $1.1 billion was pending. Breakdown by type of project follows:

Gas, $1.3 billion; refining, $1.1 billion; supply and transportation, $727 million; natural gasoline, $265 million; marketing, $11 million and production, $38 million.

Firm To Double Tubing Output

Precision tubing for defense will be produced at a $4 million plant planned by Shenango-Agaloy Tube Co., Youngstown. The company already has certificates of necessity and engineering surveys are under way to select a site.

Tubing produced will be both welded and seamless, and will equal present production from the firm's Sharon, Pa. and Springfield, O. plants.

Scrap Men To Head for College

Institute of Scrap Iron & Steel Inc. has opened seminar enrollment for junior executives of the scrap industry. Planned at Carnegie Institute of Technology in Pittsburgh, Aug. 24-29, the seminar will include a trip to steel mills and scrap yards in the district and lectures on the iron and steel scrap industry.

Windows of Washington

By E. C. KREUTZBERG Washington Editor

Three Republican senators want to do something about the makeup of the Wage Stabilization Board as a safeguard against decisions like that in the present steel case

THE TRIPARTITE system of deciding labor disputes, think three Republican senators, is unconstitutional and needs a revamping.

Senators Dirksen, Bricker and Schoeppel are undertaking corrective measures in the hope of preventing a recurrence of decisions like those in World War II and in the present steel case. Since WSB is made up of six outright labor representatives and six public members known to be sympathetic to labor, the six industry representatives are hardly more than stand-ins. The dice are loaded, say the senators in effect.

What To Do—Senator Dirksen introduced S. 2645 as his corrective measure (it would force the President to appoint a majority of public members to WSB). Under his bill, now in the Senate Banking & Currency Committee, there would be ten public members, three labor members, three industry members.

Senators Bricker and Schoeppel do not think Senator Dirksen's bill goes far enough. They want a board comprising only public members. And they think if Senate approval is required before appointment of WSB members, there will be less danger of a biased board in the future.

Right now the senators are conferring to develop a bill they can sponsor jointly.

Fair Trade . . .

Machinery manufacturers suffering from unfair practices of competitors will want to look over the Federal Trade Commission's new booklet "Trade Practice Rules for the Floor Machinery Industry." From it industrialists can get a good idea of what can be done—with government approval—to stamp out objectionable selling.

Sharp Teeth—The code really has teeth: FTC is prepared to bring action against violators. Most of the rules ban practices that are illegal.

Banned practices include:

- Misrepresentation and deception in general.
- Deception through failure to differentiate between wholesale and retail transactions.
- Misrepresentations as to installments sales contracts, their terms and conditions.
- Deception as to salary or commission when hiring salesmen.
- Misrepresenting products as conforming to standards.
- Deception on rebuilt or second-hand machines.
- Misuse of such terms as "close-out," "discontinued lines," "special bargains."
- Commercial bribery.
- Substitution of products.
- Imitation of trademarks.
- False invoicing.
- Maintaining fictitious prices.
- Using false warranties.
- Unfair practices in consignment distribution.
- Tie-in Sales.
- Pirating competitors employees.
- Prohibited wrongful below-cost selling.

Any industry can get a similar code of ethics by making overtures to the Bureau of Industry Cooperation, Federal Trade Commission, Washington 25, D. C.

Keeping Up on Regulations . . .

If you've missed getting DPA and NPA releases on regulatory material, there's a good reason: The mailing list service was discontinued Apr. 15. If you want to get the material, you'll now have to go to the nearest of the Commerce Department's 97 field offices. Possibly you can get it through your chamber of commerce or your trade association. Those organizations may be procuring the material in bulk from the Commerce Department, Division of Printing Services, Distribution Section, Washington 25.

One way of keeping informed on regulatory material is to subscribe to the Federal Register. It is issued daily and carries all government orders and releases. Price: $15 a year. Subscriptions should be sent with a check to the Superintendent of Documents, Government Printing Office, Washington 25.

Six Foot Under

A 72-inch pipe goes into the ground at Ellenton, S. C., site of the $2.2 billion Savannah River Plant being erected by E. I. du Pont de Nemours & Co. for the Atomic Energy Commission. Construction of the huge plant will require 25,000 tons of structural steel, 85,000 tons of reinforcing steel, 95 miles of transmission wires and 85 miles of underground water lines

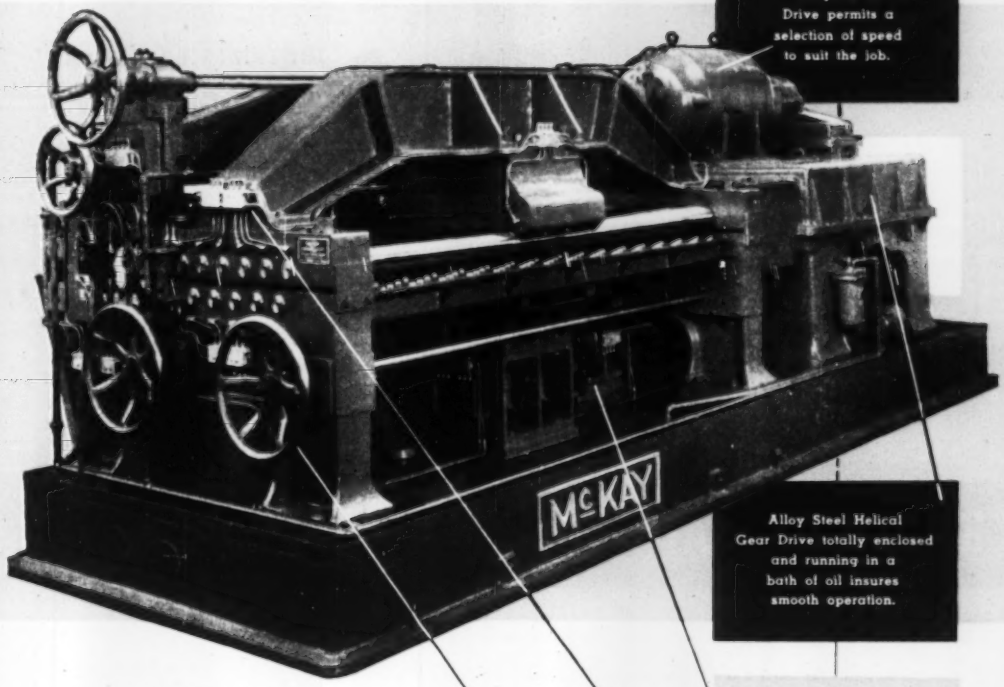
Trailing Subcontracts?

Small manufacturers will have a chance soon to inspect a trailer fitted up with products bought by Navy's Bureau of Ordnance. It is to spend three to five days in Baltimore, Wilmington, Philadelphia, Newark, New York and other central points throughout the country. One section of the trailer is a booth where small firms eager to get government business can put on record products they make

Some of the items exhibited as examples of what small industry can produce for BuOrd: Cast iron practice bombs, plastic parts, electrical connectors and other components for rockets, various screw machine and other machined products and torpedo components.

why do McKay Machines

LAST LONGER ?



Multi Speed Motor Drive permits a selection of speed to suit the job.

Alloy Steel Helical Gear Drive totally enclosed and running in a bath of oil insures smooth operation.

Rugged construction consistent with steel mill design permits continuous operation with a minimum of down time.

One shot system provides correct lubrication for all moving parts.

Compact design with all adjustments easily accessible to the operator.

Engineers and Designers of Equipment for the Automotive, Fabricating and Steel Industries

The McKay Flex Roll Sheet Processor is universally accepted by the automotive and stamping industries for eliminating stretcher strain and reducing scrap loss due to breakage in die drawn parts. The Processor combines a deep flex rolling under tension and a thorough cold working of the steel sheet by roller leveling, to condition it for deep drawing operations.

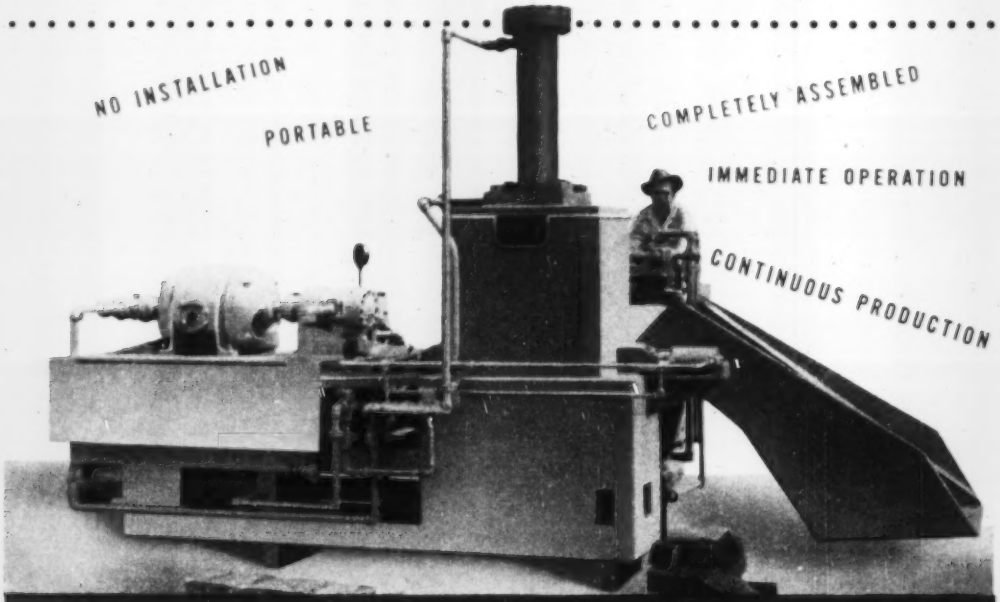
McK McKAY

The McKAY MACHINE *Company*

YOUNGSTOWN, OHIO

ASSOCIATED WITH THE WEAN ENGINEERING CO., INC.

Harris Non-Ferrous Metals Baling Presses

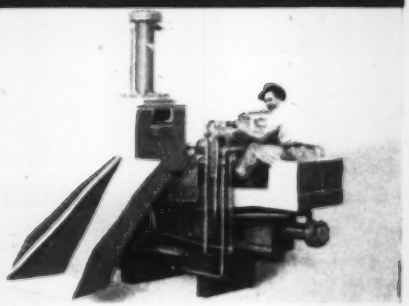


Bundle Size Attracts Dealers and Smelters

The HARRIS Non-Ferrous Metals Baling Presses were designed primarily for use in baling non-ferrous scrap. A particular feature of this design is that continuous baling is obtained, since the charging box is open while the bale is being made and ejected. The charging box is large enough to handle bulky material such as wire, sheets, etc. Pressures used make an exceptionally dense bale—approximately 40% density.

Dealers find these presses excellent also for baling sheet iron clippings and tin cans. The size and density of bundles are especially attractive for charging in electric furnaces.

The three models of this design provide an ample range to meet all requirements.



Size of Charging Box	33" x 33" x 24"	Vickers Vane Type Rotary Pump	2,000 lbs. per sq. in.
Average number of bales per hour	60-70	Space Required	10' x 12'
Size of Electric Motor	50-Hp. 1200 Rpm	Shipping Weight	20,000 lbs. (approx.)

AVERAGE SIZE OF FINISHED BALE

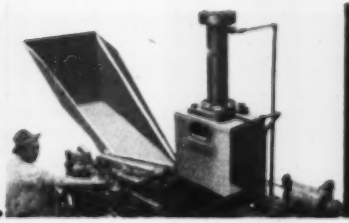
NF-40	5" x 5" x 15"
NF-50	5" x 7" x 15"
NF-80	8" x 8" x 15"

AVERAGE WEIGHT OF BALE

NF-40	40-60 lbs.
NF-50	50-70 lbs.
NF-80	80-100 lbs.

AVERAGE TONNAGE PER HOUR

NF-40 One and one-half tons
NF-50 Two tons
NF-80 Two and one-half tons



HARRIS FOUNDRY & MACHINE CO.

Reclamation Engineers Since 1889

CORDELE, GEORGIA

Free Pricing in Germany Nears Reality

After more than 20 years of being told what prices to charge by central steel associations, German steelmakers will soon be setting their own selling prices

RUHR STEELMAKERS may have a free pricing system in Germany for the first time in 20 years. For the steelmakers that means a disconcerting task of figuring their own costs correctly, for the German people a chance to see industry work under the spur of competition and for buyers of German steel, higher prices.

Following higher scrap iron prices which are already free, some steelmakers have announced increases of 45 marks per metric ton for rolled steel. Experts predict a general price rise of 10 to 15 per cent, or about 45 to 60 marks per ton, will follow.

Complete Breakdown—Pressure to break down price controls completely derives from the situation in scrap, plus a need for more flexible pricing. Germans believe the world will eventually, perhaps soon, be entering a buyers' market for steel. They want to be able to adjust pricing. Already Germans find exports of more common rolled steels have declined and they fear that outlets for other ordinary steels like wire, barbed wire, and wire nails, will dry up in the same manner.

Only about 100,000 to 110,000 tons of steel are currently being exported, consisting mainly of tubes, ship plates and high grade specialty steels.

Net effect of the various drives for a free pricing system is that official price ceilings are rapidly becoming paper law only.

Postwar Recovery—German raw steel production reached 1.3 million tons in March, 1952, highest mark since the war. Of that March total, 160,000 tons were based upon the use of coal from the United States. In February, 1.2 million tons of steel were produced of which 190,000 tons were based upon U.S. coal. The March output was equivalent to an annual rate of 15.8 million tons of steel, which precludes any serious steel shortage in Germany, short of an allout global war.

Authenticated News

PAKISTAN NEEDS TECHNICIANS
. . . foreigners help train them

IBRD Loan Goes to Pakistan

The International Bank for Reconstruction and Development has passed its first loan to Pakistan. Amounting to $27.2 million the loan will be used for rehabilitation and improvement of the country's railways.

It's all part of Pakistan's six-year development program, to cost about 2600 million rupees ($800 million). The United Nations, International Labor Organization and American Point Four agencies are teaming up to send technicians to the country to provide training for local students.

Part of the railway equipment to be provided by the IBRD loan will be purchased in France. Most of the rest of the equipment, costing a total of $15.2 million, will be purchased in the U.S.

Italy Tallies Up for 1951

The Italian iron and steel industry had a good year in 1951. Unofficial figures show the Italian output of cast iron was 928,948 tons and ingot steel, 3,047,535 tons, in 1951, compared with 503,768 tons and 2,362,430 tons, respectively, in 1950. That's an 84.4 per cent increase in output of cast iron and a 27.7 per cent increase for steel.

With increased production, Italy imported less. During the first 10 months of 1951 Italy imported 518,541 tons of ingot and semi-finished iron and steel, or about 16 per cent less than the 616,881 tons imported during the like period of 1950. Output of hot-rolled steel during 1951 was 2,383,067 tons, and 93,156 tons of iron alloys were turned out, an increase of some 26 per cent for rolled products over 1938.

NSA Retires More Ships

Representatives of 48 steamship companies operating government-owned cargo ships for the National Shipping Authority have been told that sharp cut-backs in foreign aid exports will probably result in eliminating the need for government ships under the mutual security program during the rest of this year.

Coal exports for 1952 had been estimated at 42 million tons. This is now expected to drop as low as 17 million tons, of which more than 8 million tons have already been carried during the first three months of 1952. Privately owned shipping is expected to be able to lift the remaining amount.

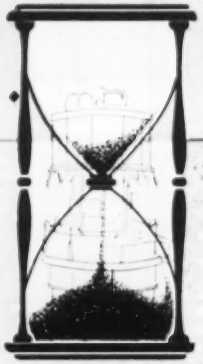
The NSA has already notified its general agents that 266 ships were to be withdrawn from active service. The additional cut-back will effect nearly 100 more. NSA's general agents operate about 700 government-owned ships.

Export Quotas Raised

An additional 31,000-ton quota of carbon steel wire, wire products and wire rods has been made available for export licensing under the CMP in the second quarter, announces the Office of International Trade. This brings the second quarter export quota of CMP carbon steel to a total of 383,678 tons.

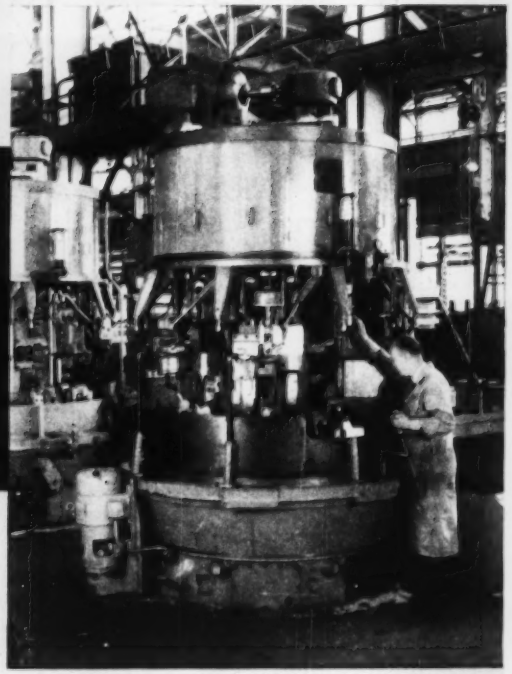
The OIT points out that license applications for exports against the supplementary allocation will be approved only if the applicants submit documentary evidence that the material covered by applications will be available from mill or other sources in the second quarter.

Sands of Time . . .



As the Hour glass accounted for the passing of time the Bullard Mult-Au-Matics have, in many plants, established manufacturing time schedules with an attendant record for time savings.

Whatever the pace, there is always manufacturing economy and efficiency in the Mult-Au-Matic Method.

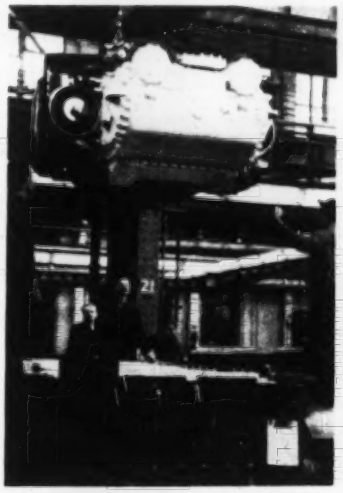


Whether it is the keyed up pace for Defense or War or the milder pace of peacetime production, Mult-Au-Matics can be adapted to the requirements of the moment.

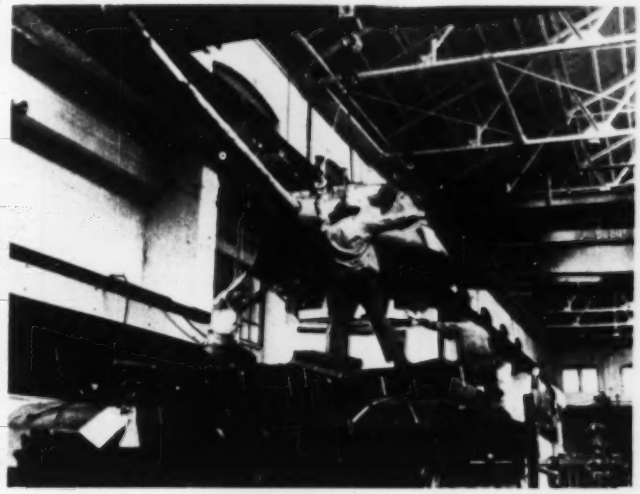
THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom



M-47's POTENT POWER PACK
...Continental engine, Allison transmission



AT AMERICAN LOCOMOTIVE'S SCHENECTADY PLANT
. . . tank turret is lifted from a subassembly line

The Army is dissatisfied with Ordnance's running of the Detroit Arsenal and may turn it over to private industry, perhaps Motor Products Corp.

DETROIT

THE GOVERNMENT'S tank program has been criticized frequently and loudly.

Two of the troubles thoroughly aired are the inability of the guns on newly developed tanks to be brought to bear on their targets and the alleged unwillingness of foundries to make armor castings.

The Latest — Latest of the troubles is over the operation of the Detroit Arsenal at Center Line, Mich. This facility is being operated by the Army's Ordnance Corps. It builds M-47 medium tanks, designs and produces pilot models of combat vehicles and trucks and manufactures spare parts for equipment still in operation but not in production.

Its functions are vital but its operation has become a source of dissatisfaction to the Army. For this reason Ordnance has approached the automotive industry to sound it out on running the production side of the facility.

No decision has yet been reached by the Army as to the advisability of having an industry operator. At least two of the automakers who have been approached—Ford and Kaiser-Frazer—are cool to the idea. Three other companies, however, are interested, or at least not yet ready to say "No." These are General Motors Corp., Chrysler Corp. and Motor Products Corp.

In the Lead—Some sources give the last named an inside track on the assignment if the Army decides that the facility can operate better under private direction. E. J. Hunt, now with Motor Products, managed the facility for Chrysler Corp. when that company built and ran the plant during World War II. Mr. Hunt is said to have accompanied Assistant Secretary of the Army Karl R. Bendetson on a one-and-a-half day inspection of the Arsenal and was present for the secretary's conversation with its commanding officer, Col. Glenn C. Wilhide. Secretary Bendetson's report on the operation is said to be highly uncomplimentary, but the final decision as to whether the plant can be run more economically and with better results by a private operator will be made by his superiors.

Within Ordnance there is no unanimity as to the merit of private operation. As a testing ground for new production processes for the manufacture of military vehicles the Arsenal has made a few notable contributions, and quite a little has been made of the economies which have been achieved there through manufacturing short-cuts. Whether these are less than private industry could have obtained had it had control of the operation is a moot question.

Fills the Gap — On the other hand, the Arsenal is a unique operation and fills a vacancy for experimental work which a private operator might not be able to tackle. It is capable of large-scale production of tanks. During the war there were four side-by-side assembly lines in operation. Run by Chrysler, which delivered its first tank from the facility in April, 1941, the plant turned out

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as many as 800 tanks a month and supplied a total of 25,000 tanks of 12 different types and more than 3100 carloads of tank replacements parts in the ensuing four and a half years. Since the war and back in Ordnance's hands, however, it has been less of a manufacturing center than a workshop. Currently only one assembly line is active and that is operating at less than capacity.

A tank-automotive research center is coming into being adjacent to the Arsenal which presumably will release much of the space now taken up by these activities. Under construction for a year, this development and engineering center is far from completed. Until it is ready for occupancy, the Arsenal itself cannot very well be turned over to industry without some of the projects suffering.

Already Started — Weighing against any immediate action in turning the plant over to a private operator, too, is the fact that a tremendous tank producing industry is already in a well advanced stage of completion. Each member of the auto industry's Big Three will soon be building tanks. Chrysler at Newark, Del., General Motors through its Fisher Body Division at Grand Blanc, Mich., and Ford at Livonia, Mich. The Newark facility has already completed the pilot model of the T-43 heavy tank. GM's Cadillac division at Cleveland has been in production of T-41 lights for many months. American Locomotive Co., along with the Arsenal, has been making M-47 mediums at Schenectady. Fisher Body last week announced an increase in its M-48 order from $195 million to $474 million and a 480,000 square foot expansion of manufacturing space. Others have completed armored vehicles in the tank family and are tooling up for high volume if it is required.

The Matter of Cast Armor — Figuring in the Army's consideration also must be the problem of suppliers, the most prominent of which are the cast armor makers. Reactivation of the armor shop at East Chicago, Ind., by American Steel Foundries has been a nerve-wracking job for many top ASF men. The most bitter complaints have been voiced over the high cost of returning this plant to operation because of its almost complete lack of maintenance in the postwar period.

Lakey Foundry Corp. in Muskegon is still up in the air as to whether its proposal to construct an armor shop will be accepted by the Army. Its castings would be hulls and turrets for the M-48 medium which Ford and Fisher Body will build. The Cadillac tank, originally designed to use a cast hull, reportedly turned to rolled armor instead because of cost considerations.

Misfire? — Much criticism has been leveled against a calculated risk which Ordnance took when fighting broke out in Korea. It rushed into production the M-47 by by-passing the conventional (and time-consuming) mock-up, pilot model, engineering and field test stages. What happened at first as a result of this gamble made front-page headlines. The tanks were unacceptable to the Army field forces but continued to be produced in quantity.

Last Wednesday provided the pay-off which should go a long way toward vindicating the Ordnance people who chose this course. With announcement by the Army that the M-47 is now acceptable for delivery to troops here and overseas, Ordnance has taken some of the wraps off the tank.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,688	658,918
March	521,855*	802,737
April		680,281
May		695,898
June		653,662
July		522,858
August		571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161
Week Ended	1952	1951
Mar. 15	120,392	182,819
Mar. 22	125,347	174,953
Mar. 29	132,850	184,514
April 5	125,668	158,076
April 12	124,740	162,839
April 19	130,000*	166,502

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

The Specs — Resembling outwardly the M-46 Patton which was an interim design composed of the hull and turret of the wartime M-26 Pershing with a new engine-transmission combination, the M-47 weighs approximately 48 tons, is powered by the Continental air-cooled 810-hp V-12 engine. This engine, in combination with the Allison cross-drive transmission, is said to enable the tank to outmaneuver any known enemy tank.

Its firepower and accuracy are reported by the Army to be outstanding better, Ordnance men say, than any medium tank ever before produced. It was the turret traversing mechanism which had previously made the tank unacceptable. This "bug" finally was whipped. The gun sight is equipped with an automatic compensator which restores the aim immediately after firing so that no manual adjustments are required to correct for recoil. Two separate fire control systems give both gunner and tank commander control of the weapon, the commander being able to override the gunner if a better target is sighted.

Compromise — The tank as a whole represents a compromise resulting from the tight purse-strings of Army's Research and Development budget after the war. Instead of spending money in building a few complete prototypes, they elected to concentrate on development of components. A completely new medium, however, the T-42, was on the drawing board at the time the Korean war started, and its turret design and fire control system was completed. The M-46 was considered a good tank but lacked fire power. Result was that the M-47 took basically the M-46 hull and the T-42 turret and gun and went into production although no complete design drawings of the entire tank then existed.

The Army now calculates that a year's time was saved by the action, and it is understood about 1600 M-47 tanks are now available to troops. Not yet acceptable are the T-41s but Army sources indicate their deficiencies will yield to the same kind of concerted engineering effort which finally pried the M-47 out of storage.

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•

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3104 Smith Tower, Seattle, Washington
P. O. Box 1633, Tulsa, Oklahoma
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803 Loew Building, Syracuse, New York

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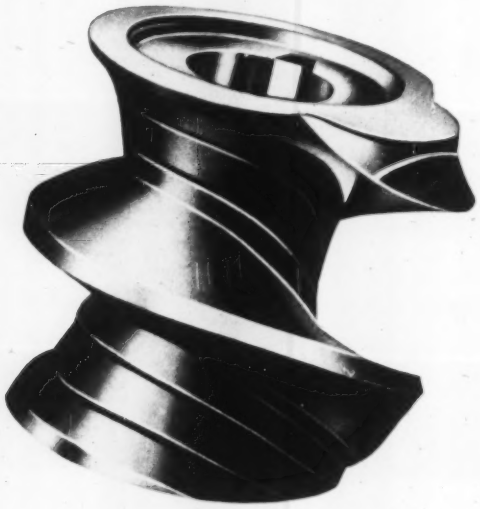
Graph-Mo steel cam machines 25 to 30% easier —and stays precise after 40,000 hours' operation!



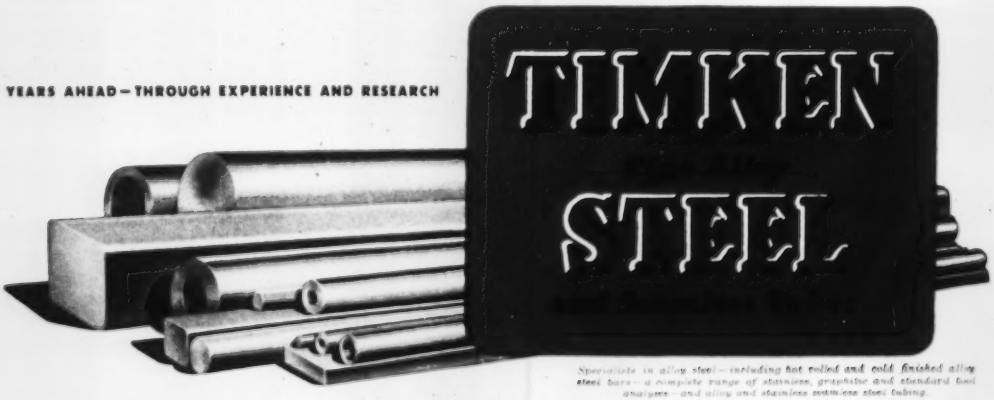
MAKERS of the Ferguson roller gear drive were looking for a steel for the cam that would be extremely wear-resistant, yet easy to machine. The steel they were using caused high cutter-breakage.

Metallurgists at the Timken Company recommended Graph-Mo. Ferguson reports these results: "Graph-Mo improved machinability 25 to 30%. There is little or no distortion in heat treating—good surface wear. We do not know of a cam ever wearing out. Precision has been maintained on multi-color printing presses—without replacement of cams—after more than 40,000 hours running time."

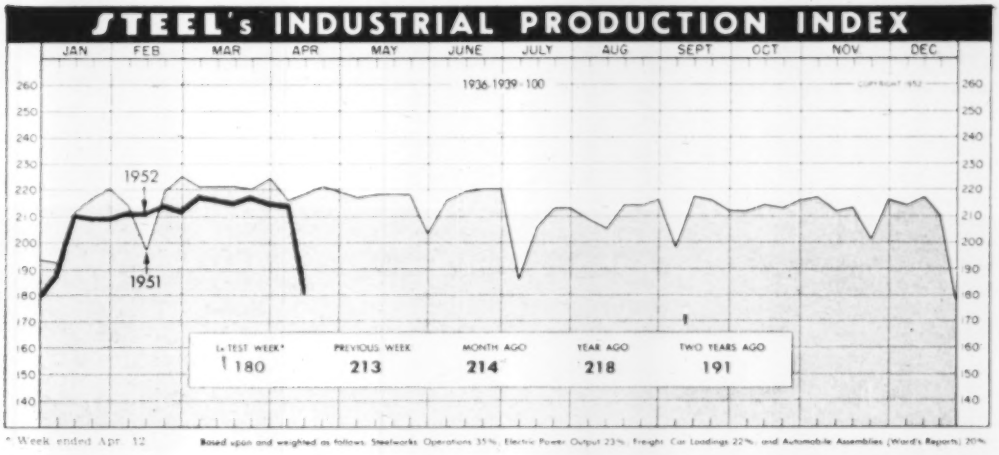
Graph-Mo is one of four Timken® graphitic tool steels. Because they contain free graphite, they machine faster and easier than other tool steels. This free graphite, together with diamond-hard carbides formed during heat treatment, provides excellent resistance to wear and abrasion. Other advantages are superior non-seizing qualities, good stability, less tendency to scuff and score, and uniform response to heat treatment.

For information on Timken graphitic tool steels—and their wide application for gages, dies and machine parts, get the new 9th edition of "Timken Graphitic Steel Data Book". The Timken Roller Bearing Company, Steel and Tube Div., Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.



* Week ended Apr. 12 Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%

Manufacturers of civilian goods are discouraged by the lack of consumer spending. Industrial activity index drop reflects steel output decline due to the strike threat

RETURN to normal level of industrial activity after a week's strike scare isn't as encouraging as it may first seem. Soft spots in our economy continue to appear.

Diverse trends have been taking place in various industries in the past year. Output trend of defense industries has reached upward, while producers of civilian goods were turning out less.

Buyer's Market? — Up to now, materials shortages were the chief reason for production lags by civilian metalworking companies. Many producers believed that an easing of controls would be the signal for renewed high output. Now, more and more civilian manufacturers are saying that the days of a seller's market have passed. What brought this changed attitude? People just aren't buying in the manner or volume expected.

During the past year, wholesale and consumers' prices have drifted slowly downward. And the downdrift hasn't stopped yet. Manufacturers watching the sagging prices are hesitant about buying more materials and stepping up production schedules. They're still waiting for signs that people will start spending with more regularity.

Index Topples — Reflecting the drop in steel output during the strike threat, STEEL's industrial activity index fell 43 points to 170 per cent of the 1936 to 1939 average. Following the drop in steel production, freight car loadings and electric energy generation showed minor declines. Auto output dipped slightly too, but because of the short workweek.

Demand Uncertain . . .

Reduced flow of cars into showrooms and an important reduction of stocks of most independent automakers has led to a relaxation of sales aggressiveness by some car dealers. The next two weeks may see much of this complacency dissipated, says *Ward's Automotive Reports*.

A sales spottiness is occurring in many sections of the country, although the market is absorbing virtually every unit put into the field. Any prediction of future sales must take into consideration today's depleted stocks. A number of producers are pepping up their sales forces. This does not necessarily indicate an expectation of slow sales in the next few weeks, but preparation for the allout battle for customers in the fall.

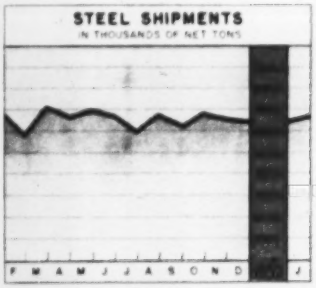
Production for the year so far provides a poor comparison with the year-ago output. *Ward's* calculates U. S. and Canadian automakers turned out 124,740 autos and trucks in the week ended Apr. 12, a drop of 928 units from the output of the previous week. Production for the same week in 1951 totaled 162,839 autos and trucks.

Substantial Loss . . .

Steelmaking furnaces were rapidly put back into operation after a steel strike was averted by government seizure of the companies. American Iron & Steel Institute estimated that 2,015,000 net tons of ingots and steel for castings were turned out in the week ended Apr. 19. Output for the previous week dropped to 1,294,000 tons which means about 826,000 tons of steel were lost. Output for the same week a month ago totaled 2,127,000 tons. Year-ago production stood at 2,057,000 tons of ingots and steel for castings.

Drop in Orders . . .

Buyers are not too optimistic about present business conditions.

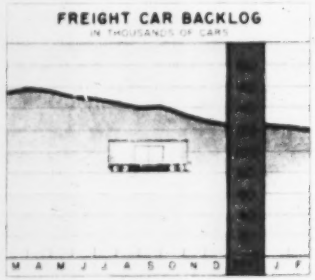


Steel Shipments

Net Tons

	1952	1951	1950
Jan	6,389,192	6,908,658	5,482,691
Feb	6,358,293	5,776,229	5,134,780
Mar		6,190,945	5,744,348
Apr		6,638,510	5,780,453
May		6,318,708	6,252,672
June		6,645,847	6,192,438
July		5,988,574	5,668,898
Aug		6,756,589	6,328,464
Sept		6,207,491	6,145,554
Oct		6,444,093	6,503,531
Nov		6,509,048	6,051,145
Dec		6,411,105	6,432,776

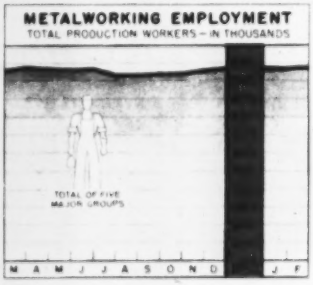
American Iron & Steel Institute



Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1952	1951	1952	1951
Jan	5,338	26,356	120,251	144,758
Feb	7,338	15,947	118,900	154,861
Mar		11,271		156,619
Apr		6,628		155,871
May		4,919		150,628
June		6,793		147,725
July		2,417		144,810
Aug		1,525		139,014
Sept		9,631		140,139
Oct		3,464		132,792
Nov		6,752		129,158
Dec		3,369		123,947
Total		96,100		* End of month

American Railway Car Institute

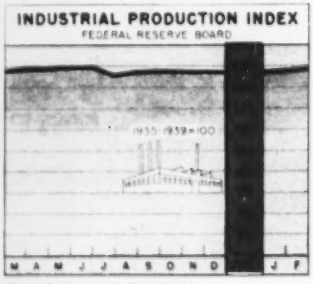


Metalworking Employment

Production Workers, Five Major Groups
In Thousands

1951	Prim. Mtls.	Fab. Prod.	Mach. Inery	Elec. Mchy.	Trans. Equip.
Jan	1,149	847	1,192	711	1,175
Feb	1,153	852	1,215	716	1,233
Mar	1,159	858	1,231	724	1,253
Apr	1,161	859	1,239	718	1,243
May	1,162	860	1,242	707	1,233
June	1,172	843	1,242	706	1,237
July	1,155	833	1,235	684	1,187
Aug	1,165	816	1,211	695	1,197
Sept	1,150	811	1,219	709	1,210
Oct	1,160	809	1,242	707	1,205
Nov	1,151	804	1,236	717	1,242
Dec	1,166	807	1,270	724	1,238
1952					
Jan	1,163	807	1,276	723	1,240
Feb	1,162	810	1,270	727	1,260

U. S. Bureau of Labor Statistics



Industrial Production Index

	Total Production		Iron.	Steel	Non-ferrous	
	1952	1951	1952	1951	1952	1951
Jan	220	221	261	255	215	224
Feb	222	221	261	262	219	218
Mar		222		263		212
Apr		223		264		210
May		223		263		206
June		221		261		204
July		213		253		198
Aug		217		254		198
Sept		219		257		201
Oct		218		261		202
Nov		219		261		209
Dec		218		263		210
Avg		220		259		207

Federal Reserve Board

Issue Dates of other FACTS and FIGURES Published by STEEL

Construction	Mar 31	Ironers	Jan 21	Ranges, Gas	Feb 25
Durable Goods	Mar 31	Machine Tools	Mar 10	Refrigerators	Feb 25
Employ., Steel	Mar 24	Malleable Castings	Apr 14	Steel Castings	Apr 14
Fab. Strct. Steel	Apr 7	Prices	Feb 18	Steel Forgings	Apr 7
Foundry Equip.	Apr 14	Pumps	Mar 31	Vacuum Cleaners	Mar 17
Furnaces, Indus.	Mar 31	Purchasing Power	Mar 3	Wages, Metalwkg.	Jan 28
Gray Iron Castings	Apr 14	Radio, TV	Mar 24	Washers	Apr 7
Steel, Sales	Apr 7	Ranges, Elec.	Feb 25	Water Heaters	Mar 24

says Purchasing Agents Association of Chicago. After surveying its members, the association reported that a substantial number of buyers—43 per cent—are apparently forced to make commitments 60 to 90 days in the future. Lower order backlogs cause much of the gloom although production and employment remain high and inventory levels are in better balance.

Although there was much pessimism about March business, most of the members indicate they believe business conditions will remain the same or improve during the remainder of 1952. Of the members polled, 32 per cent report they believe business will improve, 16 per cent say they expect it will be worse, and 52 per cent predict conditions will remain about the same.

Wages Rise . . .

American Iron & Steel Institute estimated that wages in the steel industry averaged $1.942 an hour in February. That's an increase of 2.6 cents an hour over the average in February, 1951. Estimated payroll of the entire industry in February reached $234.9 million, $15.4 million higher than in February, 1951.

February payroll and workweek averages declined from the January figures. The hourly wage average was 1.6 cents less in February than in January, when more overtime was involved. Workers averaged 40.9 hours on the job in February, compared with 41.4 hours in January.

Council Reports . . .

The April edition of *Economic Indicators*, prepared by the President's Council of Economic Advisors, reports that gross national product in the first quarter of 1952 was at an annual rate $339 billion. That's an annual rate of $4.5 billion higher than in the fourth quarter of 1951. Most of the increase was in national security expenditures, but personal consumption expenditures also rose.

Total industrial production continued at the February level, 222 per cent of the 1935-1939 average. Increased output of steel, autos

and military equipment increased the durable goods index by 1 per cent. Nondurable goods production declined 1 per cent, chiefly due to continued slackening in textile production.

National income reached an annual rate of $284 billion in the first quarter of 1952. That marks an increase of $3 billion over the rate of the previous quarter. Employees' compensation rose at a rate of $3.5 billion.

Ban Lifted . . .

Welcome news to the television industry was the lifting of the government ban on constructior of new sending stations. Lifting of the freeze—in effect since October, 1948—will make available chanaels for more than 2000 television stations throughout the country. There are now 108 broadcasting.

Increasing number of new stations may well give a substantial stimulus to sales of television sets. More than 17 million sets were manufactured from 1947 through 1951, says Radio-Television Manufacturers Association.

Shipments Decline . . .

Shipments of domestic gas ranges in March totaled 180,100 units, an increase of 27,700 units over February. During the first quarter of the year 496,600 units were shipped, compared to 552,600 units shipped in the comparatively mediocre last quarter of 1951, says Gas Appliance Manufacturers Association.

While shipments of ranges declined in the first quarter of the year, shipments of automatic gas water heaters rose more than 6 per cent above those of the preceding quarter to 447,000 units. March shipments totaled 152,200, an increase over the February figure by 6100 units, says GAMA.

Trends Fore and Aft . . .

Expenditures for iron and steel products by Class I railroads in 1951 amounted to $703 million. That's $194 million more than they spent in 1950. . . Average primary market prices slowed down their slide in the week ended Apr. 8. All commodities declined 1 per cent while all commodities other than farm and foods remained at the previous week's mark. . . Bituminous coal production dropped 1.5 million net tons in the week ended Apr. 5, to 8.1 million tons. . . Total business inventories in February amounted to $70.5 billion, $250 million below the January total.

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	61.5	102.0	105.2
Electric Power Distributed (million kwhr)	7,150	7,200	6,747
Bituminous Coal Output (daily av.—1000 tons)	1,358	1,635	1,521
Petroleum Production (daily av.—1000 bbl)	6,230[1]	6,200	6,120
Construction Volume (ENR—millions)	$228.5	$345.6	$311.2
Automobile, Truck Output (Ward's—units)	124,740	125,688	162,839
TRADE			
Freight Car Loadings (unit—1000 cars)	700	707	778
Business Failures (Dun & Bradstreet, number)	184	185	172
Currency in Circulation (millions)[3]	$28,526	$28,445	$27,138
Dept. Store Sales (changes from year ago)[3]	+8%	+13%	+13%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,544	$17,542	$15,593
Federal Gross Debt (billions)	$257.3	$257.5	$254.8
Bond Volume, NYSE (millions)	$11.0	$13.6	$23.6
Stocks Sales, NYSE (thousands of shares)	4,939	7,553	8,420
Loans and Investments (billions)[4]	$73.1	$73.7	$70.1
United States Gov't. Obligations Held (billions)[4]	$31.2	$32.0	$30.7
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92	171.92	171.92
STEEL's Nonferrous Metal Price Index[6]	243.6	243.6	246.2
All Commodities[7]	111.7	111.8	112.6
All Commodities Other Than Farm and Foods	113.4	113.4	114.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,635; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

TIME

Pheoll Screws, Bolts, and Nuts are easier to start, easier to drive and easier to tighten—because they're accurately machined and threaded. These features cut your assembly time and cost.

GTH

The grain structure and flow of metal obtained through cold heading and roll threading increases the structural strength of Pheoll Fasteners. Cold working improves thread bearing surfaces, providing greater area of contact for firmer grip. Greater strength reduces possibility of shearing, and time lost in subsequent removal and re-tapping.

CE

Step by step Pheoll inspection, through every process of production, assures uniform head size and shape; cleanly milled and recessed heads, neat chamfering and countersinking. All these factors contribute to the quality and finish which add materially to your product's final appearance. *Write* for Pheoll's product literature and price list.

THESE PHEOLL PRODUCTS INCREASE YOUR PRODUCTION RATE. Thumb Screws Machine Screws† • Wood Screws† • Sheet Metal Screws† • Stove Bolts† • Rolled Threaded Wires and Studs • Special Rivets and Pins • Brass Washers

†Furnished in slotted and Phillips Recessed Head Types

Speed Nut
SAVINGS STORIES

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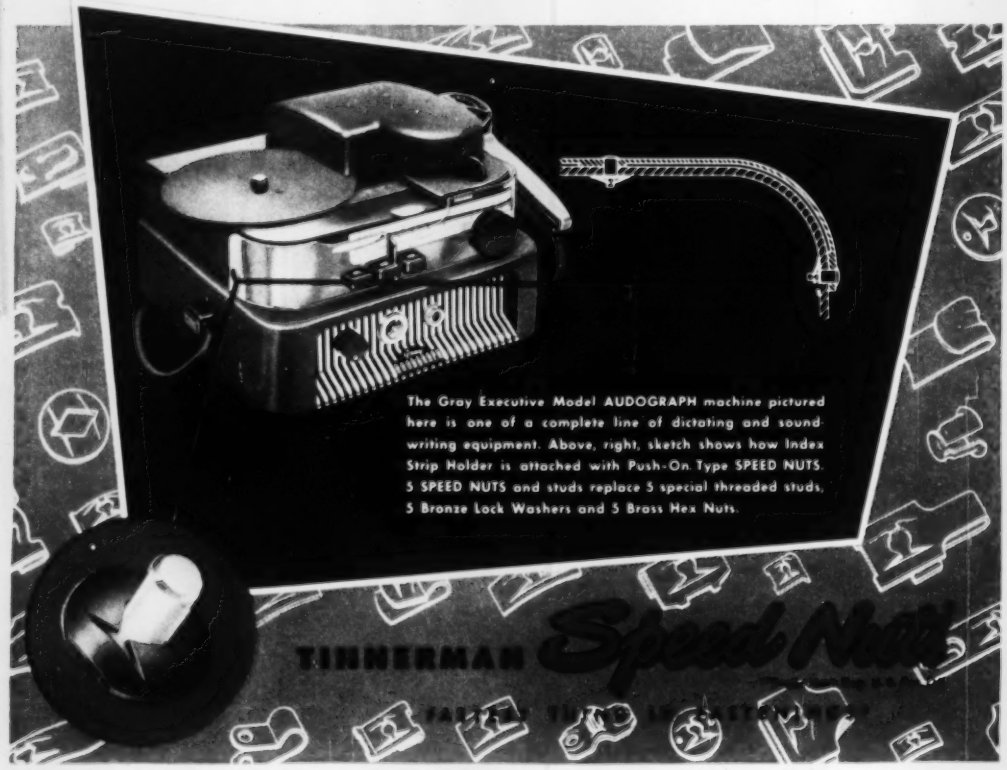
Make New Record
FOR GRAY AUDOGRAPH

Here's how SPEED NUTS made a 50% savings in time, and a 75% material savings in the assembly of Gray AUDOGRAPH Dictating Machines . . .

Engineers at Gray Manufacturing Company took a second look at the index strip on their Audograph Machine and this is what they found. Five standard Tinnerman Push-On Type SPEED NUTS could be zipped over plain studs to attach the complete Index Strip Holder Assembly in half the time . . . replacing hex nuts, lock washers and eliminating special threaded studs.

This is just one of the many SPEED NUT Savings Stories being reported every day in a wide variety of industries. Take a second look at some of your assembly operations with an eye to keeping costs down and quality production UP; your Tinnerman representative is prepared to help. SPEED NUTS are the most economical fasteners ever developed—to prove the point, we'd like to make a comprehensive Fastening Analysis of your product line. In the meantime, write for your copy of SPEED NUT Savings Stories, TINNERMAN PRODUCTS, INC., Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners, Ltd., Hamilton. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S. A.—7 rue Henri Barbusse, Levallois (Seine) France.



The Gray Executive Model AUDOGRAPH machine pictured here is one of a complete line of dictating and sound-writing equipment. Above, right, sketch shows how Index Strip Holder is attached with Push-On Type SPEED NUTS. 5 SPEED NUTS and studs replace 5 special threaded studs, 5 Bronze Lock Washers and 5 Brass Hex Nuts.

Men of Industry

JOHN P. COURTRIGHT
. . . Marion Power Shovel president

HERMAN J. BLASER
. . . new president of Seneca Wire

Marion Power Shovel Co., Marion, O., elected **John P. Courtright** as president and general manager. He succeeds **Harvey T. Gracely**, forced by illness to assume an inactive status except for possible special assignments. **J. Malcolm Strelitz** was elected chairman of the board. Other new officers include: **Adrien F. Busick Jr.**, vice president of engineering, and **Maurice V. Cornell**, vice president of sales. **David E. Rizor** was named assistant to the president in matters pertaining to sales and service.

Edward H. Huntzinger was named works manager, **Pivot Punch & Dye Corp.**, North Tonawanda, N. Y. He is succeeded as chief engineer by **Stephen Rutka. Roland P. Cercone**, formerly general manager, tool department, was named executive director of sales, a new position. **George F. Edwards**, secretary, was appointed secretary and controller.

William H. Steinkamp was appointed sales manager, industrial division, **Minneapolis-Honeywell Regulator Co.**, Minneapolis. He succeeds **L. Morton Morley**, who continues as vice president of the Brown Instruments Division, and who assumes added responsibilities concerning division and other company policies.

W. H. Harper was named to succeed **Rolf Griem** as assistant controller, **A. M. Byers Co.**, Pittsburgh.

Seneca Wire & Mfg. Co., Fostoria, O., elected **Herman J. Blaser** president and general manager. He succeeds the late **Lucian E. Kinn. H. L. Martin** was elected vice president; **F. A. Bormuth**, secretary; and **L. J. Schreiner**, treasurer and purchasing agent. Mr. Blaser has also been advanced from vice president to president and general manager of Keystone Wire Cloth Co., Hanover, Pa., and Standard Wire Cloth & Screen Co., York, Pa. He has been vice president of Seneca Wire & Mfg. since 1938 and directly associated with Mr. Kinn in this and various enterprises since 1919.

A. L. Voverka was named sales promotion and advertising manager, **Follansbee Steel Corp.**, Pittsburgh. In his 26 years of service with the firm, he has been instrumental in promotion of terne roofing, one of the company's major products.

Earle S. MacPherson, chief engineer of **Ford Motor Co.'s** engineering staff, Dearborn, Mich., was elected a vice president and a member of the company's administrative committee. He succeeds **Harold T. Youngren**, vice president-engineering, who, effective May 1, will retire after 42 years of service in the automotive industry. He continues, however, as a director of Ford and will be retained as a consultant on engineering, reporting to the president and executive vice president. He also will be a consultant to the company's product committees. Formerly with the Chevrolet Division of General Motors Corp., Mr. Youngren was appointed chief engineer at Ford in 1947.

Aeroquip Corp. appointed **Robert C. Colyer** as manager of its subsidiary, Elbeeco Inc., Jackson, Mich., manufacturer of elbow type hose fittings. For the last year he has directed Aeroquip's subcontracting and raw materials program. Assuming those duties are **A. James Crowley** and **Don Mortlock**, appointed assistant purchasing agents.

Southwest Steel Supply Co., St. Louis, elected **Gerald W. Fossieck** president and treasurer, **Preston M. Green**, vice president and secretary, and **Paul O. Stowell**, vice president and assistant secretary. Mr. Fossieck succeeds **Nat H. Wolkind**, former president, who is no longer associated with the firm.

John J. Reoch joined **Edgcomb Steel Co.**, Philadelphia, as manager of aluminum sales. For the last five years he has been associated in a sales capacity with Kaiser Aluminum & Chemical Sales Corp.

Pittsburgh Screw & Bolt Corp., Pittsburgh, elected **Gerald J. Garvey** to the board of directors to succeed **Richard D. Baker**, resigned. Mr. Garvey is president of the Gary Screw & Bolt Division, Gary, Ind. Mr. Baker also resigned as vice president of sales.

E. S. Gilmore was appointed New England district sales representative, **Clover Mfg. Co.** His headquarters are near Boston.

Benjamin T. Moffatt, a vice president of **Hewitt-Robins Inc.**, Stamford, Conn., for 11 years, was elected executive vice president. **Harold Von Thaden** continues as a vice president and general manager, Robins Engineers Division, and becomes general manager, International Division. **Austin Goodyear**, formerly assistant general manager, Hewitt Rubber and Robins Conveyors Divisions, was appointed general manager of both divisions. **R. A. Nilsen** was named

general manager, Restfoam Division.

E. Fred Buehring was promoted from general supervisor to assistant director, contract administration, **Temco Aircraft Corp.**, Dallas.

Gilbert B. Valentine was appointed branch manager of the newly established Chicago office of **Wagner Bros. Inc.** He was sales engineer with McGean Chemical Co.

Youngstown Sheet & Tube Co., Youngstown, appointed **Perry Snyder** Youngstown district engineer succeeding the late **Ray Fenton**.

Midcontinent Tube Service Inc., Chicago, appointed **Merwin S. Abrams** as vice president in charge of advertising and sales promotion.

Edward C. Buster was named factory manager, **J. H. Cristil Co.**, Edgerton, O. He formerly was assistant to the vice president—manufacturing and general superintendent at Globe-Union Inc., Milwaukee.

Loring S. Brock succeeds **A. C. Moore**, retired, as district vice president of the intermountain sales district of **Columbia-Geneva Steel Division**, U. S. Steel Co., Salt Lake City, Utah.

R. K. Compton was named director of industrial relations by **E. W. Bliss Co.**, Canton, O.

L. O. Koven & Brother Inc., Jersey City, N. J., appointed **Willard P. Cunningham** as director of engineering sales. He has been with Koven in various sales positions for 26 years.

WILLARD P. CUNNINGHAM
Koven engineering sales director

DR. I. A. OEHLER
. . . new post at American Welding & Mfg.

Dr. I. A. Oehler, director of metallurgy and research at **American Welding & Mfg. Co.**, Warren, O., was promoted to new responsibilities in the company's over-all management. He continues in direction of research activities, and assumes the newly created post of administrative assistant to the executive vice president. He joined AW&M in 1942 and previous to that was assistant chief metallurgist at Republic Steel Corp., Buffalo district.

M. O. Monsier was appointed manager, welder and electrode division, a newly created post at **Harnischfeger Corp.**, Milwaukee. He was sales manager, welding division, a post in which he is succeeded by **W. R. Stephens**, formerly a welder sales engineer.

Cecil W. Sward, sales manager and director of advertising and sales promotion, was elected a vice president of **G & W Electric Specialty Co.**, Chicago.

Dravo Corp., heating department, appointed **Fred W. Schulte** as sales engineer for its newly opened office in St. Louis.

Bede Industrial Products Inc., Cleveland, appointed **Joseph A. Sanches** New York area district sales manager.

J. C. McPherson, associated with **Consolidated Western Steel Division**, U. S. Steel Co., since 1931, was promoted to assistant vice president and manager of sales for the San Francisco district. **Kenneth Lieber** was made assistant vice president and manager of pipeline sales for all districts; **J. G. Thompson**, assistant vice president and manager of sales for the Los Angeles district; **John H. Long**, assistant vice president and manager of sales for the Texas district; and **Alex N. Silverstein**, assistant vice president to handle customer relations and other management matters.

M. K. Schoenfeldt was elected controller, **Sheffield Steel Corp.**, Kansas City, Mo.

John N. Lind was appointed general traffic manager, **National Supply Co.**, Pittsburgh. He succeeds **Martin C. Richards**, retired after more than 32 years of service.

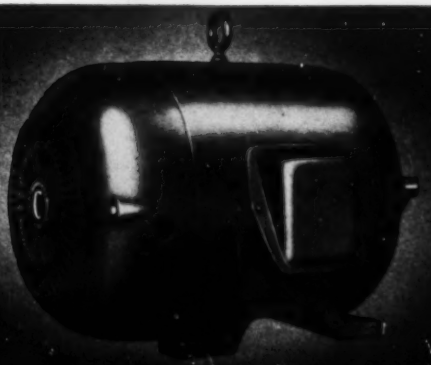
Clifford A. Stephens joined **National Motor Bearing Co. Inc.**, Redwood City, Calif., as chief rubber technologist.

Appointments in **General Electric Co.'s** newly created appliance control department, Morrison, Ill., include: **Phillip Gomez Jr.** as manager of sales, **Arnold Dunn** as manufacturing engineer, **James M. Clark** as manager of finance, **Alden L. Thomas** as superintendent of the Morrison plant, **Thomas J. Kelly** as design engineer, and **James H. McDuffie** as supervisor of personnel.

Allen K. Heydrick was appointed director of education and training, **Weirton Steel Co.**, Weirton, W. Va.

James V. Lester, controller of **Standard Pressed Steel Co.**, Jenkintown, Pa., for the last five years, was elected treasurer. **H. F. Gade**, one of the founders in 1903 of SPS and its senior vice president and

JAMES V. LESTER
. . . treasurer, Standard Pressed Steel



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T E F C

Your Maintenance Man..

who must keep your Production Turning, knows how to evaluate the inside of the Motor. Ask him about these Century Construction features.

- Vital parts of motor protected — sealed-in inner frame.
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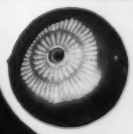
- Ball bearing housing keeps grease "in"—dirt "out"—lubricated for several years' normal service, with grease plugs when you want to lubricate bearings.



- Easy to remove fan guard for inspection — 2 screws hold steel fan guard in place.

Century C motors

RICHARD B. KLINE
. . . heads Burke Steel Co.

CLARENCE J. DORR
. . . sales mgr. of Sterling Engineering

E. H. STAU
. . . directs Avildsen-Pacific Div.

treasurer, retired after 49 years as an officer of the company.

Changes in management of **Burke Steel Co. Inc.**, Rochester, N. Y., include: **Richard B. Kline**, promoted from treasurer and general manager to president-general manager. **John C. Hoover**, promoted from director of purchases and warehouse manager to treasurer and assistant general manager. **H. Kennedy McCook**, elected assistant secretary. **Joseph A. Mancini**, promoted from forging superintendent to manager, forging operations. **Emil A. Janette**, promoted from city salesman to manager of warehouse salesmen. **Thomas L. Lee** was named to the board of directors to fill the vacancy on the board created by the death last November of Webster H. Kline, company president. Mr. Lee retired last year as general manager, Rochester Products Division, General Motors Corp.

C. B. Holst was named manager of the model change systems department, a newly created major component of the manufacturing staff of **Ford Motor Co.**, Dearborn, Mich. **James L. Cameron** succeeds Mr. Holst as manager, purchasing administration department.

Clarence J. Dorr was named sales manager, **Sterling Engineering Co.**, Laconia, N. H., subsidiary of American Machine & Foundry Co. Since last October he has been sales manager of Kurman Electric Co. Inc.

George L. Langreth was named finance vice president, **Blaw-Knox Co.**, Pittsburgh.

Ira G. Deitrick was appointed to succeed **F. S. Kinsey** as manager, eastern district, lamp division, **Westinghouse Electric Corp.**, New York headquarters. Mr. Kinsey becomes manager of government sales with headquarters in Washington.

Fred W. Alger, assistant vice president, was promoted to the Birmingham sales office of **Pullman-Standard Car Mfg. Co.**, where he will be associated with F. O. Reemer, southern district sales vice president. The appointment is effective May 1.

Wilbur D. Prescott was elected president of Clevite Ltd., St. Thomas, Ont., Canada, subsidiary of **Cleveland Graphite Bronze Co. W. H. Martin** was advanced from plant manager of Clevite to vice president-manufacturing.

Avildsen Tools & Machines Inc., Chicago, appointed **E. H. Stau** as general manager of Avildsen-Pacific Division, with headquarters in Los Angeles. Formerly general manager in charge of production and sales for Cherry Rivet Co., Los Angeles, for the last 11 years, he now assumes responsibilities for West Coast sales and manufacturing activities of Republic Drill & Tool Division and Celfor Tool Division of Avildsen Tools & Machines.

Russell B. Read, former director of payroll accounting, was appointed planning director for **Westinghouse Electric Corp.**, Pittsburgh.

Theodore Worthman, formerly with General Motors Corp., was appointed director of internal audits and procedures for **Willys-Overland Motors Inc.**, Toledo, O.

Champion Rivet Co., Cleveland, elected **C. P. Diemer** vice president in charge of engineering. **J. A. Diemer** was appointed superintendent of the Cleveland plant.

O. R. Moss Jr. was named district sales manager, Home Appliance Division, **Murray Corp. of America.** His headquarters are in St. Louis.

OBITUARIES...

V. M. Dobeus, 50, president and general manager, **Tractomotive Corp.**, Deerfield, Ill., died Apr. 8.

Julius B. Wantz, 78, inventor and co-founder of **General Electric Co.'s** x-ray department in Milwaukee, died in River Forest, Ill., Apr. 6. He had retired in 1946.

W. W. Galbreath, 69, president, **Alliance Porcelain Products Co.**, Alliance, O., from 1933 until he retired in 1943, died Mar. 11.

Ludwig A. Plass, founder and president, **Swedish American Steel Corp.**, Brooklyn, N. Y., died Apr. 8.

Ralph B. Loucks, 57, a co-founder of **Inland Wire Products Co.**, Chicago, established 27 years ago, and who retired as vice president in 1950, died Apr. 11 in Florida.

Michael J. Graham, 60, director of manufacturing, **International Harvester Co.**, Chicago, died Mar. 14.

Henry B. Thomson, 65, owner of **Thomson Braze-Weld Co.**, Detroit, died Apr. 9.

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Reliance "thread-cutting" Springtites and Sems can answer both of these problems. First, by giving you tighter and longer-lived assemblies (improved product quality) and second, by cutting out costly old-fashioned tapping operations that add hours to factory costs. Write today for samples and let Reliance "thread-cutting" Springtites and Sems reduce your production costs.

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Production AND Engineering
NEWS AT A GLANCE

SPOT WELD MONITORING—Search for a means of nondestructively testing the quality of spot welds may be ended by an electronic control for monitoring the resistance change during welding. The control measures instantaneous resistance between electrodes by dividing the voltage across the electrode tips by the welding current flowing through them. After initial resistance variations subside, a reference resistance is set up. When the resistance falls a preset percentage of this reference value, the welding current is stopped. Lights indicate if the preset resistance change occurs before the minimum weld-time setting, between minimum and maximum or after the maximum weld-time setting. Basically, the weld current is shut off after a specified change in resistance of the weld. The monitor then indicates if this change occurred within the acceptable range of time.

SHOP PLANNING EASIER—A master file of some five thousand ¼-inch scale templates of the most-used machine tools and shop equipment should go a long way toward simplifying visual planning and layout of metalworking plants. Produced on 12 x 18-inch film sheets, the templates can be arranged singly or in groups to lay out practically any plant. Repro-Templets Inc. says 165,000 man-hours were needed to prepare the patterns.

AIRCRAFT SAVINGS—Cost-cutting efforts by the nation's aircraft manufacturers are saving the taxpayers millions of dollars, the Aircraft Industries Association reports. One manufacturer, for instance, saved the government $770,000 by redesigning and simplifying a crate for shipping 30,000 drop fuel tanks. Another builder reduced cost of riveting on 100 aircraft by $85,000, by perfecting an automatic riveting machine.

FASTENERS STANDARDIZED—ASA's new standards for square and hexagon bolts and nuts is expected to simplify manufacturer, distributor and user inventories, reduce the number of wrench openings by 40 per cent. The standard will not be a success, the fastener industry points out, until standard sizes are called for in specifications. p. 86

COLD LIGHT SOURCE—G-E engineers are experimenting with a new source of illumination which causes materials to glow with cold light when an electric current passes through them. The lighting source uses an effect known as "electroluminescence." This can be produced with a piece of glass coated with a transparent but electrically-conducting film over which is placed a layer of a powdered "phosphor," like that which gives the light in a fluorescent lamp. A metallic film on top of this makes a sandwich of phosphor between two conducting layers. When the conducting layers are connected to an electric current, the phosphor glows with cold light, rather than the type of light from the white-hot filament of the incandescent lamp. Single crystals of the phosphor can be made to glow, yielding many times as much light as with the powder.

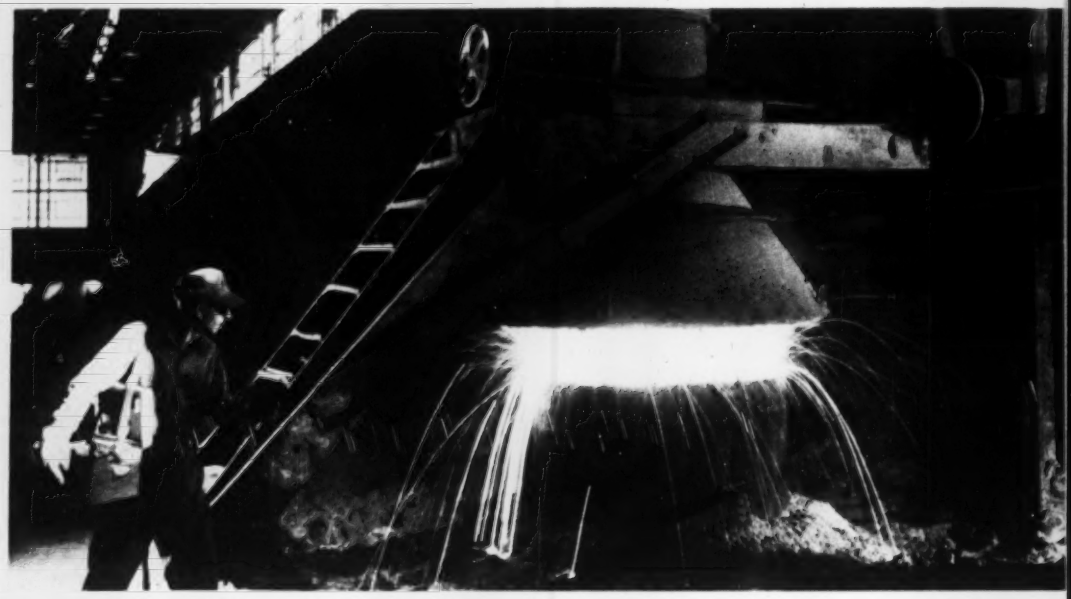
SCRAP: 176 MILLION POUNDS—Since last summer, the automotive industry has turned up enough dormant scrap metal to equal the weight of more than 55,400 automobiles. The industry's scrap committee reports 18 million pounds of nonproductive scrap was released in January, bringing the cumulative total to 176 million pounds. Nonproductive scrap is in addition to the tons of metal regularly returned to the steel mills from manufacturing operations.

NO UNCOMMON METALS—In this age of nuclear fission, jet engines and gas turbines, metallurgists are making the so-called uncommon metals uncommon in supply only. Nonferrous alloys of chromium nickel, cobalt, molybdenum, tungsten, columbium, titanium and tantalum are being depended upon to meet high temperature and corrosion resistant requirements of modern aircraft power plants. Where will all the metal come from? The geologists and mining engineers can answer that one. p. 80

PLANNED RESEARCH—Research for a small or medium-sized business is the best health insurance the company's management can buy. That's the consensus of many metalworking companies who treat research exactly as other forms of insurance. Industrial firms spend, on the average, only 2 per cent of gross sales on research. In the metalworking industries, research gets about 3 per cent in firms with gross sales up to $500,000. Companies with gross sales up to $5 million spend about 1.3 per cent. p. 85

NO MORE SQUINTING—Workers in chemical research and control may have an answer to their long-standing complaint against fading markings on thermometers. Major improvement is a thermometer on which all graduations and numbers are etched into the glass and then filled with a permanent fused-glass filler that cannot wear off. Evidently the only way to make the markings fade is to dissolve the thermometer itself (by boiling for hours in caustic). Here are some of the conditions under which thermometers with fused markings were tested: One month in fuming sulphuric acid at room temperature; 32 hours in boiling carbon tetrachloride; 30 hours in boiling toluene; 31 hours in boiling concentrated sulphuric acid; 30 hours in boiling turpentine.

Metalworking Outlook—p. 43 Market Outlook—p. 141



Molybdenum shown above in production at Climax Molybdenum Co., has considerable strategic importance

MINOR METALS ARE MAJOR ISSUE

New sources are sought for lesser known, yet strategic metals. Applications are on the upswing and future supplies must be greater than today's short rations

By J. L. BRAY
Professor of Metallurgical Engineering
Purdue University
Lafayette, Ind.

DISTRESSING shortage of what we considered to be common metals such as lead, copper, aluminum and manganese developed with outbreak of World War II. The uncommon metals, uranium, titanium, cobalt and tantalum suddenly became strategic ones. Today the situation is still worse. On the Mesabi range (the source of about 80 per cent of our iron ore) many independent operators are scraping the bottom of the barrel. Even the large ones such as the U. S. Steel Co., Bethlehem and Republic have been forced to initiate the development of large foreign sources of iron ore.

Only two nations in the world, United States and Russia have sufficient basic metals within their borders, or easily obtainable, to expand and develop their industry. Even if we lack large amounts of perhaps five to seven strategic metals as against eight or twelve for Russia, we ought to find but small comfort in that fact.

High Speed Age—This is the age of nuclear fission, jet engines and gas turbines. Steels are no longer adequate because the alloys are commonly being subjected to temperatures of the order of 1300 to 1600 F and where higher temperatures pose still stiffer problems. The aim, of course, of the designers is to reach 1800 to 2200 F where the efficiency is greatly increased. Tungsten, molybdenum and tantalum with melting points of 6170, 4760 and 5450 F, respectively, can withstand such temperatures, and still retain a large part of their original strength. All are ruled out by high cost, short supply or unfavorable chemical characteristics. We must depend on nonferrous alloys of chromium, nickel, cobalt, molybdenum, tungsten, columbium, titanium and tantalum. Examining the present situation of supply, demand, and future possibilities for these strategic metals, what is our situation today?

Nickel—Roughly, 99 per cent of our nickel comes from Canada. This nation supplies 90 per cent of the world's 160,000 tons of metal. Russia is the second largest producer. Most of her metal comes from the confiscated Petsamo property of the International Nickel Co., formerly in Finland, but now "liberated." New Caledonia is a very poor third at less than 7000 tons per year.

It is estimated that we shall use close to 100,000 tons of nickel this year. While we are still distressing-

Black Bird mine of Calera Mining Co. located in an isolated part of Idaho is a new cobalt development. (Photo courtesy of Idaho Mining Association)

ly short of nickel, new plant additions for concentration, reduction and refining and the development of new mines will ease the situation. International Nickel Co. is expanding its mines and concentrators at Sudbury, Ontario; Falconbridge organization likewise. New discoveries in the Canadian Northwest are very promising.

We are rehabilitating the nickel facilities at Nicarco, Cuba, which was utilized during World War II to treat low grade ore containing less than 1 per cent nickel. Hope is to reach a production of 15,000 tons of nickel per year by the end of 1952.

Chromium — For this essential metal we depend on South Africa, Turkey, the Philippines, Southern Rhodesia, Cuba and New Caledonia. Domestic consumption in 1951 was 1,200,000 tons of chromite ore. Of this we produced 2000 tons, an improvement over the 400 tons of 1950 but still far short of our needs.

We have large deposits of low-grade ore in the West, but high cost of the beneficiation processes, and the use of other strategic materials in the construction makes it appear that not in the foreseeable future will the situation ease markedly. Russia has excellent deposits of high grade ore, exported 350,000 tons to this country as late as 1949.

Cobalt—World's largest producer of cobalt is the Union Miniere, Belgian Congo, followed by the Union of South Africa, Turkey, Rhodesia, Philippines and Cuba. Domestic consumption in 1951 increased over 50 per cent from 1950 to a peak of about 10 million pounds. There were only two domestic producers until 1951 when a deposit of copper-cobalt ore was developed in Idaho. Deposit, with a new method for its treatment, has proved sufficiently encouraging to warrant the building of a refinery in Utah; eventual planned capacity, 3 million pounds per year.

At the same time, expansion is going on in Canada. At Cobalt, Ontario and in the Northwest Territory, productive capacity is being increased greatly. The fact remains that the United States is dishearteningly short of cobalt, so essential to the manufacture of jet engines and gas turbines. Likewise new uses are being developed in the shape of alloys for other equally important purposes.

Tungsten—Our situation is a bit better with tungsten because we do possess many low-grade deposits, the development of which has been encouraged by the Korean war and our unfriendly relations with China. Normally, the latter supplied about 40 per cent of the world's needs with the United States, Portugal, Bolivia, Korea and Russia trailing far behind. We have made very encouraging progress. Of our 12,000-ton consumption (up 300 per cent from 1950) of tungsten concentrates, we produced over 6000 tons in 1951. For the remainder we are still dependent on the foreign sources.

Columbium — This is another metal that does not occur in this country in appreciable quantities, nor is there immediate prospect of finding deposits. It is used in high temperature alloys only to the extent of 0.3 to 4 per cent, and yet is absolutely essential for highly stressed ones. Few statistics are available for this metal which, only recently has become important. It is safe to say world production was only about 2,500,000 pounds. Of this 65 per cent came from Nigeria, the remainder from the Belgian Congo, Mozambique, Uganda and French East Africa.

Tantalum — United States has practically no deposits of tantalum. World production is ridiculously small as compared to other metals —about 200,000 pounds of concentrates. We produced perhaps 5000 pounds and imported 140,000 pounds in 1950. Our principal sources have been the Belgian Congo, Australia and South West Africa. Brazil is a potential large source, but that country, as well as the Belgian Congo, hesitates to expand output greatly unless assured of a market by long term agreement.

Titanium — Titanium today occupies much the same place as aluminum did in the opening years of the present century. Raw material situation is very promising because we have very large deposits of relatively high grade ores. Canada, with still larger deposits, has a smelter in operation on the shores of the Gulf of St.

Lawrence, producing pig iron and titanium slag. The latter is shipped to the United States for reduction and refining.

Unfortunately, we lack a process that can produce large quantities of moderately priced metal, sufficiently pure to be used as such, or as an alloying agent. Encouraging results have been obtained with one company producing an ingot of 500 pounds and the price lowered to $5.00 per pound for the 96 to 98 per cent grade in March 1952.

It is used to the extent of 0.2 to 3 per cent in high temperature alloys in question. It will be in the not far distant future a new material of construction competing actively with stainless steel and aluminum. It has valuable properties, with a melting point of 3130 F as compared to 1200 F for aluminum, and will find use in plane skins, guided missiles and rockets. Research has only started on its alloys. We know that it is easily alloyed and that very small amounts of carbon, nitrogen, chromium, bring about tremendous changes in the physical properties of the resulting alloys.

Cermets—Best of the high temperature alloys do not give the performance desired in all applications. Much research is going on in the development of cermets. These are metallic oxides such as alumina having a high melting point, pressed and sintered together with a metal in a manner similar to that used in making cemented carbide cutting tools. Carbides, oxides, chromium, titanium, beryllium, cobalt and tungsten are being used experimentally.

A recent test using a titanium carbide with 5 to 30 per cent of cobalt molybdenum and tungsten proved that such conglomerates are much more satisfactory under laboratory conditions than the best alloys at temperatures of 1800 to 2200 F.

A Critical Time—In this time of nuclear fission, jets and gas turbines, developments come with breathtaking suddenness. Such a development has taken place with germanium, formerly regarded only as a deleterious impurity in the reduction of electrolytic zinc. Now electrical engineers predict that the new junction transitor may replace the conventional electronic tube on the bases of being more compact, efficient and cheaper.

We cannot afford to be left behind, and yet we may unless we develop our own resources more effectively and rapidly than we are now doing. The success obtained in our search for new sources and new methods of reduction and purification of uranium indicate that we can lick the problems presented by these little known metals if given the opportunity.

Standardization Brings Economy in Parts Packaging

REALIZING the packaging method used for its products did not fill the bill in several areas, Black & Decker Mfg. Co., Towson, Md., solved its problems through a package standardization program. The method used in 1949 to package the company's 1500 accessory items not only was inadequate, unsightly and incommensurate with the quality and reputation of the products but was actually costly, J. F. Apsey Jr., advertising manager, told the American Management Association's packaging conference.

First need was to improve physical strength of most accessory packages. A study was made of some old style packages after they had reached distributors halfway in their travels to the consumer. It is easy to recognize the costliness of replacing damaged and broken products, and making up shortages due to loss or pilferage which these packages encouraged.

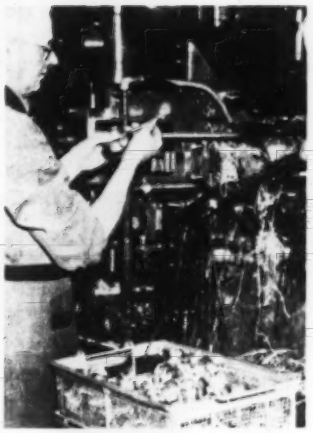
Standard Selected — Numerous packaging types were tested, Mr. Aspey said, before deciding to standardize on the tray and sleeve type, for reasons peculiar to Black & Decker's particular packaging problems. Decision was based on the fact that a tray with double glued side walls provides corner strength, resists crushing and has three distinct advantages: It is a folding carton delivered flat and requires no setup machinery, it presents an unobstructed end for labelling and it is a tray procurable from many sources. Completing the package is a glued sleeve that gives additional strength by providing a tension strap around the tray.

Better labelling of boxes was the second problem. This phase is not foreign to cost since good labelling facilitates correct order filling, helps reduce errors and invites selection of a particular product over its competition. It was necessary to gain as much space as possible for improved legibility of catalog numbers and product names on the end labels.

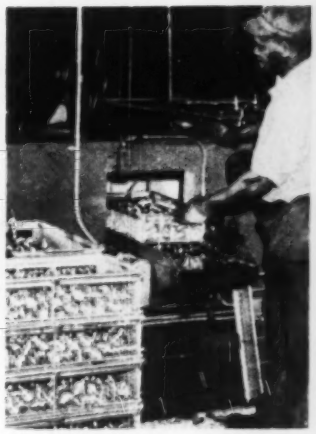
Positive Identification — Adequate brand identification was the third consideration. Having eliminated trade marks and firm names from the end labels, it was necessary to display these identifications strongly elsewhere on the package. A step-and-repeat decorative pattern is used on the package sleeve offering greatest opportunity for repetition and dominant visibility of trade mark.

Since these items were sold under two brand names a problem of balancing stocks between the two lines without destroying boxes and repackaging was a factor in the solution. Using the tray and identification method adopted reduced the minimum requirements of duplicate stocks of identical accessories carried in inventory. Further simplification resulted from developing a method for imprinting tray end labels in the company's plant.

Wholesale Reductions — Where 55 different boxes were used to package 599 different items of the most popular and highest volume accessories, four new boxes do the same job. Yearly requirement for this group is 591,000 boxes. Disk and wheel shaped accessories that required 35 different packages, are all concentrated in one box. A number of makers' boxes were included in this group, giving poor identification and not conforming to the new packaging pattern. The most complicated group included forged tools, light but bulky tubes, and high-price precision finished pilots. In this category reduction from 24 to 5 different types was made.



Machined parts flow directly from a screw machine into the wire basket



Specially designed degreaser accommodates baskets filled with parts

Baskets are stacked for storage. Open end keeps parts within reach

Baskets Vitalize Small Parts Handling

Containers are storage bins plus transit facilities for small parts. Fewer handling operations reduce lost parts count and save on damaged units. Time savings is a bonus

WIRE BASKETS, cousins of the supermarket version, are used to alleviate the chronic headaches of small parts handling. Aeroquip Corp., Jackson, Mich., developed this precision-made container for storing and transporting countless varieties of small parts in their plant. Jaxon Wire Products Co., also a Jackson firm, manufactures the baskets.

Prior to using baskets, parts were shuttled back and forth in metal tote trays, and wooden trays were designed to protect the delicate machining on the parts. Many disadvantages mounted from these earlier methods of handling parts as they traveled from operation to operation. Parts often passed through as many as 20 machining operations before completion. Many have a tolerance of 0.003-inch. Skillful and careful handling of parts was of paramount importance.

Easy Access—One of the first features to be incorporated in the new baskets was that which made parts accessible from one end of the basket. Often it was necessary to store parts for a few days between production operations, and the baskets had to be stacked in criss-cross fashion to enable a worker to get samples from any basket in the pile without disturbing those above. An opening similar to a pour spout was put in one end to permit easy access to the contents of the basket.

Another vital part of the design was the factor of weight control of the basket. The first baskets varied in weight as much as 4 ounces each. This error could and did lead to a miscount of as many as 48,000 pieces per lot with the weigh counting method. New specifications call for a standard weight with $\frac{1}{2}$-ounce tolerance plus or minus, thus holding to a minimum possible discrepancies in production counting.

Worker Protection — Other improvements also became necessary. Need for a sturdier construction became apparent when ragged edges appeared, making handling dangerous to workers' hands. To eliminate these jagged edges a U-bar type molding strip was designed to fit all around the outer top edge of the basket covering all edges and providing added reinforcement.

Advantages of the new baskets are numerous. Parts can be transported and stored in the same containers. Containers can be stacked to save space and while stacked contents are reached easily through the end openings. During machining operations the parts are taken from the baskets, machined and replaced in the same type basket. Parts can be cleaned and weigh-counted without removing them from containers.

Electronics Digest Published

Papers and digests of material presented at the 1951 National Electronics Conference are contained in a 736-page book published by the conference. Work contains 79 papers, with charts, diagrams and tables. It covers electronic research, development and application in audio systems, computors, high frequency measurement, information theory, magnetic amplifiers, medical and industrial fields, microwave and propagation, servo theory, signal detection, television and tubes. Book is priced at $5 and requests should be sent to 852 E. 83rd St., Chicago 19.

Cemented Carbide Families Grow

Cemented chrome carbides available in limited quantities, combine high hardness, corrosion and heat resistance with light weight for special applications

By J. S. GILLESPIE and I. L. WALLACE
Carboloy Department
General Electric Co.
Detroit

TABLE I
PHYSICAL PROPERTIES OF CEMENTED CHROME CARBIDE (GRADE 608)

Hardness	— 88 Rockwell "A"
Density	— 7.0 gms/cm^3 (slightly lighter than SAE-1095)
Transverse rupture strength	— 100,000 psi
Compressive strength	— Higher than most hardened steels.
Coefficient of thermal Expansion	— 6.4 x 10^{-6} in the range of 70°-1292° F.
Abrasion resistance	— Good—some less than tungsten but much better than hardened steels.
Resistance to oxidation	— Only a slight surface discoloration after 24 hours in air at 1800° F.
Resistance to corrosion	— Excellent
Magnetic permeability	— Nonmagnetic

NEW developments in, on and with cemented carbides are almost daily occurrences. Even with the wide range of physical properties covered by tungsten carbide, there are applications in which the particular combination of properties required is not available.

For instance, the combination of good abrasion resistance, light weight and coefficient of thermal expansion the same as steel, all combined with good mechanical strength, were required for one job. Tungsten carbide is heavy and has a coefficient of thermal expansion about one-half that of steel.

Metallurgists working on this problem tried all sorts of carbide chrome, titanium, tantalum, etc. From this work and work on similar problems, new families of carbides have developed.

Cemented Chrome Carbide—One of these families is cemented chrome carbide. Today this material is available (still in limited quantities) in one particular grade with a chemical analysis of 83 per cent chrome carbide, 2 per cent tungsten carbide, 15 per cent nickel. Note that little tungsten and no cobalt are used.

Physical properties are shown in Table I.

For gage blocks, cemented chrome carbide is proving excellent.

In the petroleum industry, valves that handle crude oil must withstand the corrosive attack of acids and brine in the oil. These valves must also resist the abrasion of the everpresent sand and grit, and at the same time be rugged and long-lasting because it is expensive to pull a valve from the bottom of a well. Chrome carbide is being used to take care of all these problems.

Titanium Carbides — Another family of carbides that shows much promise is titanium carbide. These materials show excellent rupture strength and oxidation resistance at high temperatures and in general, are resistant to thermal shock.

In addition, materials are light in weight, have good abrasion resistance and high compressive strength. This family of carbides is being developed at present primarily for use in jet engine applications.

New grades of cemented tungsten carbides are being developed when some application requires an unusual combination of physical properties such as armor piercing projectiles. There are now far-reaching cutting tool applications with existing grades of tungsten carbides. There are more and more mechanical or machine part applications all the time—such as bearings for high speeds and high loads, machine cams, and feed rolls. There are domestic applications such as paint scrapers, knife sharpeners, and masonry drills. There are medical applications such as dental burs.

TABLE II—CHEMICAL TESTS

Loss in Weight in Milligrams Per Square Decimeter Per Day
Average of 10-24 Hour Immersion Periods

Test	Chemical Used	Series 600 Chrome Carbides	Results Other Cemented Carbides WC + Co	WC + TaC TiC + Co	WC + TaC + Co	18-8 Stainless Steel
1	(10% Sulphuric acid)	55	158	302	135	1650
2	(50% Sulphuric acid)	31	100	120	81	7300
3	(37% Hydrochloric acid)	190	600	650	160	Total Loss
4	(35% Nitric acid)	19	250	330	110	45
5	(Aqua regia)—	810	2820	4500	1550	Total Loss
6	(Sodium hypochloride)	100	230	4500	1550	Loss
7	(5% Sodium hydroxide)	0.6	22	7	12	1.0
8	(50% Sodium hydroxide)	1.0	3	3	4	2.0
9	(5% Calcium chloride)	0.3	41	24	27	1.3
10	(1.0% Citric acid)	0.6	176	150	160	2.0
11	(5% Lactic acid)	1.5	200	170	255	5.1

From data presented by the authors at the 20th annual meeting of the ASTE, Chicago, Mar. 17-21.

Planned Research

Profitable Business Insurance

By MALVERN J. HILER
President
Commonwealth Engineering Co. of Ohio
Dayton, O.

Technical audit to determine avenues for research will result in a sound program that produces new developments

CONSTANT search for better ways to conduct a business have shown management it is necessary and profitable to give attention to research. Research for the small or medium-sized business is the best health insurance available. It is insurance against loss of market, loss of competitive position, loss of prestige—loss of profits. Research insurance must be provided before a loss occurs, not after a competitor has cornered the market.

Research today is being treated just exactly as other forms of insurance by industry. Forecast for 1952 indicates that it will be one of the greatest years in history for industrial research. The never-ending hunt for new products and processes will be at fever pitch this year.

A Business Cost—Cost of research is a legitimate cost of doing business, just as are the costs of manufacturing, selling, and distribution. It is an essential investment, as necessary as the investment in plant, equipment, and property.

Yet some members of management shudder at the very thought. They are thinking in terms of giant industrial laboratories and expenditures of hundreds of thousands of dollars.

The facts are different. National average expenditure for research by industrial firms is only 2 per cent of gross sales. In the metalworking industry, these figures are slightly different. Firms with gross sales up to $500,000 spend about 3 per cent on research. Firms with gross sales up to $5 million spend about 1.3 per cent. This amounts to an annual expenditure of $15,000 for the smaller company and $65,000 for the bigger one.

In a survey it was discovered that 60 per cent of the metalworking companies support their own research programs. About 65 per cent of these have their own research laboratories. Nearly 50 per cent also used outside facilities.

These companies listed their research objectives in this order of importance:

1. Improvement of existing products.
2. Development of new products.
3. Improved manufacturing procedure.
4. New uses for existing products.
5. Development of better raw materials.
6. Salvage of waste materials.

This list might serve as a guide for setting up research objectives. One of the biggest mistakes management can make is to do research for research's sake rather than outline definite objectives. If a program is started because it's the thing to do, it may be doomed to failure.

Determining the Objective — Best method is a thorough analysis of your company's competitive position. Where there is a plan, and an objective, it is usually based on the influence of competition. Whether this competition takes the form of better sales or the introduction of a new product, the firm contemplating research should take a hard look at its internal organization.

To do this, a relatively new type of service is available. This is the technical audit. It can best be compared to the annual financial audit. It reviews a company's operations from an engineering point of view. It examines engineering and research developments; present and future state of competitive products and processes, degree that products meet customers' demands, where products fail to meet customers' demands, and the extent of competition on present sales. Industry trends are also analyzed.

Backing up the engineering report is a series of recommendations supported by engineering with a cost estimate of incorporating the recommendations into a firm's operation. Sales, advertising, and production are also analyzed. It is not an efficiency engineering report. It is simply a fact finder and recommendations are based on what the auditors believe to be a profitable method of operation.

In one case, an 80-year old firm quadrupled its sales within two years after using a technical audit. A new product was produced and many new facts were brought to light for the firm's management.

In another case, a technical audit prevented a company from entering a new field that it thought profitable. Facts indicated that that field was producing to its sales capacity and that another firm would operate at a loss. A technical audit requires about three months and should be done on an annual basis, due to the influence of competition.

From the technical audit, the research program can be started. A rule of thumb in setting appropriations can be based on the national or industry percentages. Every dollar invested in objective research yields about four dollars in extra profit. Program should be closely budgeted. The actual money spent should be arranged on a monthly basis to coincide with the program's progress. Usually, the monthly budget will be the same for the life of the program. Many programs are completed within three to six months. Others may take a year or two.

Across-Flats Dimension (Wrench opening)						
Size	Old Standards				New Standards	
	Cap Screw Auto. Bolt	Regular Bolt	Light Nut	Regular Nut	Bolt	Nut
1/4	7/16	3/8	7/16	7/16	7/16	7/16
5/16	1/2	1/2	1/2	9/16	1/2	1/2
3/8	9/16	9/16	9/16	5/8	9/16	9/16
7/16	5/8	5/8	5/8	3/4	5/8	11/16
1/2	3/4	3/4	3/4	13/16	3/4	3/4
5/8	7/8	15/16	15/16	1	15/16	15/16
3/4	1	1 1/8	1 1/16	1 1/8	1 1/8	1 1/8
7/8	1 1/8	1 5/16	1 1/4	1 5/16	1 5/16	1 5/16
1	1 5/16	1 1/2	1 7/16	1 1/2	1 1/2	1 1/2
Larger Sizes					Same as Regular Series	
Height of Head or Thickness New Bolts - Approximately same as Regular bolt. New Nuts - Same as Light nut in 1/4 - 5/8 sizes; Same as Regular nut in larger sizes.						

Table shows a comparison of the new and old dimensions of light and regular series bolts and nuts. Shaded areas indicate sizes eliminated under new plan

Fastener Sizes Standardized

ASA standardization of square and hexagon bolts and nuts calls for industry co-operation. Cost will be lower and inventories lighter under approved ASA B18.2-1952

STANDARDIZATION of square and hexagon bolts and nuts is approved by the American Standards Association. Designated as ASA B18.2-1952, "Square and Hexagon Bolts and Nuts" standardization received final approval on Mar. 24.

Standard will benefit both the fastener producer and the user. Number of items made will be reduced; will eventually mean lower cost. It will simplify manufacturer, distributor and user inventories, as well as making products more available. Number of wrench openings will drop by at least 40 per cent.

Sponsored jointly by Society of Automotive Engineers and the American Society of Mechanical Engineers, the program is allied with one published by the British and with a forthcoming Canadian program. At first glance the standards appear to have enlarged and complicated the situation rather than simplifying it. Reason is the necessity for including sizes which are now specified and which, with industry co-operation, will eventually be eliminated. Result is a list including the new standard recommendations plus those bolts and nuts no longer recommended but still called for by industry.

Relies on Demand—Bolt and nut manufacturers will have to produce what is wanted. In his address at the annual ASTE meeting in Chicago, John S. Davey, assistant general manager of sales, Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., points out that only when the standard sizes are called for in specifications can the program become a success.

Important change is that, with the exception of heavy bolts, head dimensions of all series of hexagon bolts and cap screws have been consolidated. Recent tendencies toward larger diameters and higher-strength screws proved that the cap screws in the higher ranges had too small a head. These cap screws ⅝-inch and over are now identical to the bolts in that range.

Nuts Included—New standard is also used for nuts. Light and regular nuts have been made to different dimensions. These nuts both have the same function and load requirements. Now they are combined into one series. The light series nut from ⅝-inch down fulfilled the bearings-area requirements, but large sizes fell under and proved inadequate. The regular series, while in excess of the requirements in the sizes below ⅝-inch were in accord with them in the larger diameter. It was, therefore, decided to adopt the light series through ⅝-inch and the regular series for the larger sizes.

One result is that the head and nut use the same wrench, with the exception of the 7/16-inch diameter. Here there is a slight difference between the nut and head, because the nut had to be adjusted up to the next sixteenth. Difference is so small that it shouldn't give much trouble.

Suggestions for Choice — Here are some things to do in choosing the proper bolt. Whenever possible stay with a standard; specials are expensive and hard to obtain. Moreover, if there is a field

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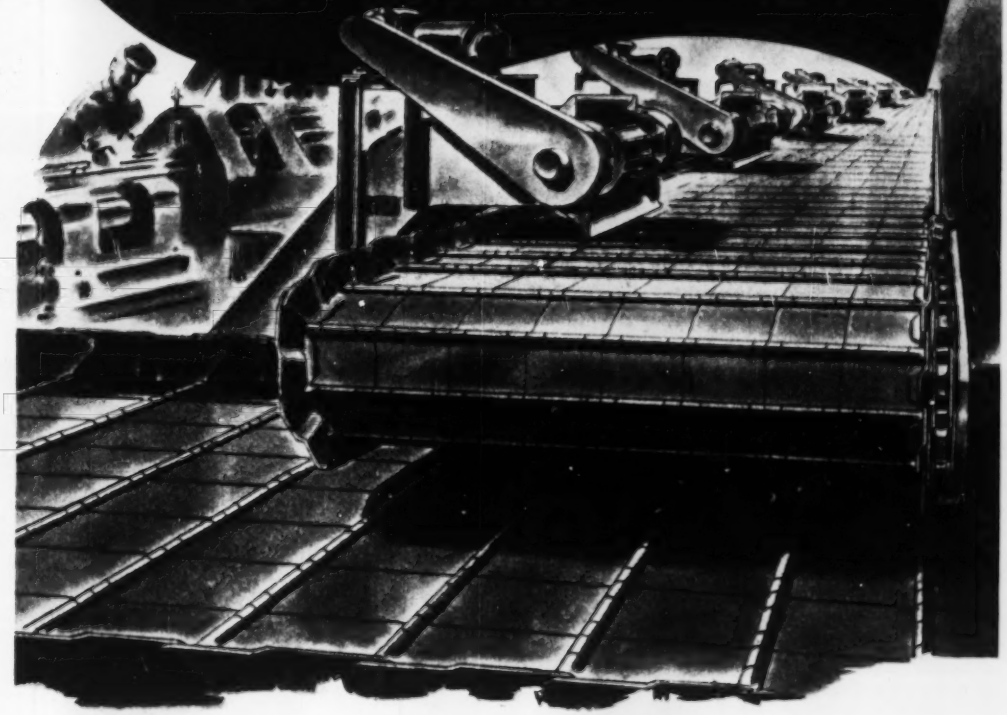

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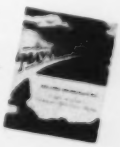

525-ME

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adjustment or repair problem, the special may be impractical. It is safest to go to ASA standards for dimensions. Fastener manufacturers have good catalogs showing stock items, and maintain an association, Industrial Fasteners Institute, which is always ready to help. ASTM publishes specifications covering the physical properties and SAE also sets up various physical grades.

This new standardization follows one already in effect in the U. S., Canada and Great Britain on the unification of screw threads. Plans will help in the joint manufacture and service of parts produced by the three countries.

Test Furnace Planned

An experimental low-shaft blast furnace with a daily output of 100 tons is being erected adjacent to the Ugine steel plant, Liege, Belgium, at a cost of about $800,000. This announcement was made at a meeting at the Bureau of Mines, Pittsburgh, March 20, and arranged in co-operation with the Office of Technical Service (Department of Commerce) and the Bureau of Mines (Department of the Interior).

Stack is to be used for studying the possibility of using low-quality ores in the blast furnace employing the fine part of the ore, coke dust, low-quality semicoke, and pellets composed of fine ores and raw coal. Fuel, air and pressure variations will be studied in various combinations which will require as many as 24 separate experiments. Variables are: Normal coke, fine coke, refined coal pellets, raw coal pellets, ordinary air, enriched air, pure oxygen, normal pressure and high pressure.

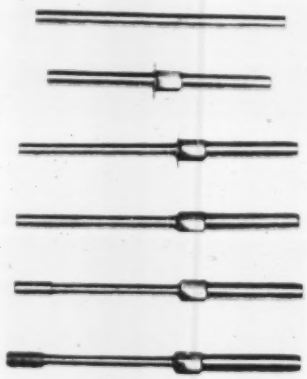
It is hoped that methods may be derived which will permit the use of more poor ores and coke in the future. The object is also to determine whether a low-shaft furnace is feasable in remote places for use in time of war.

Tentative dimensions of the furnace include an oval hearth 9.8 x 4.9 feet. The furnace will have a straight cylindrical shaft 20 to 22 feet high, and six tuyeres will be used for combustion. It is expected to be placed in operation by December, 1952.

COLD HEADING:

Small Parts Keep Pace with Demand

COLD HEADING can often be used to advantage on large production runs of special metal parts. Ordinarily the subject of cold heading suggests screw products and fasteners. Now, however, many of the parts produced by this process have little or nothing to do with screw fastenings. Instead they are complicated, highly specialized parts that go into thousands of mechanical applications, brake drum studs, appliance parts, electrical terminals and jet engine components.



Evolution of aircraft terminal part by cold heading. Successive steps show the piece formed from round wire

Engineering aspects of fabricating a wide variety of special metal parts by the cold heading process involve the technology of metal structure, tooling and die development, and design application. This approach applies no limitations to the shape, structure or size of the part other than structural conditions under which the metal will flow. The problem of making it flow where you want it is one of applying special tooling knowledge to the punches and dies and then placing them on equipment arranged to meet these conditions.

Ratio Doubled — Camcar Screw & Mfg. Corp., Rockford, Ill., has found these engineering principles enable them to more than double the normal ratio of wire diameter to offset structure size. It has enabled them to cold head many special shapes other than concentric round. While they find radii desirable, they are not essential in cold heading such shapes as indented hex heads or squares.

This technique produces cost advantages in permitting more versatility with single and double blow machines, where previously such specifications required progressive heading and secondary operations.

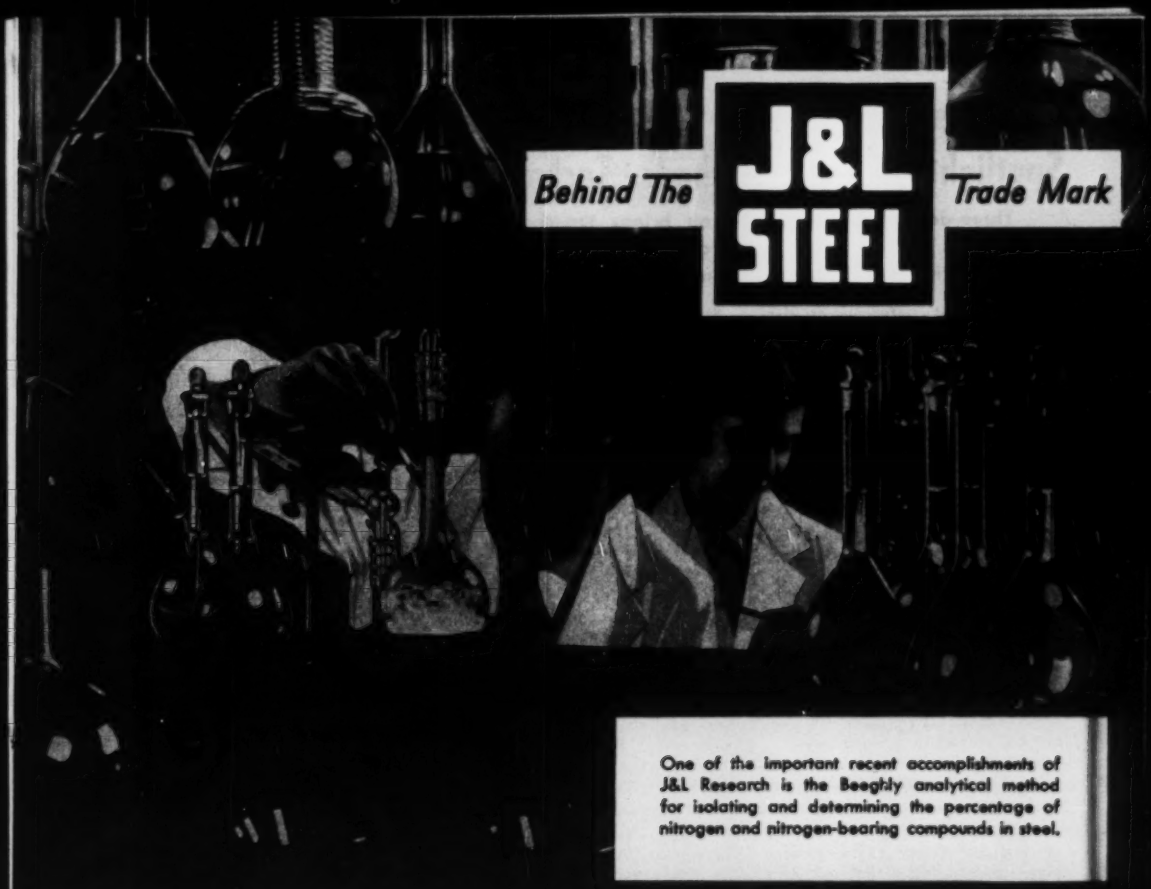
Stresses Absent—In many cases cold heading not only produces special forms and shapes faster and more economically, but also improves the structure. Absence of stresses or fractures in cold headed parts is due to the fact that the metal is cold-flowed into the desired shape rather than hammered.

Closer dimension tolerances are held by cold heading than were thought possible, giving rise to the prospect of new applications. Better surface finish is an added inducement for conversion of special parts to cold heading.

Chief consideration by the manufacturer will be whether production is large enough to qualify the part for successful cold heading. Variations in parts design are produced through combinations of cavities in the die, punch, or both, and by extrusion and supplemental secondary operations. Generally speaking, the part may be upset in a ratio five or six times the wire diameter.

Brake, Clutch Needs Calculated

Calculator applicable for specifying electric brake and clutch needs on all types of industrial machinery is available from Warner Brake & Clutch Co. Data shows stopping and starting times, mounting specifications, performance curves and formulas, torque ratings, and heat calculations. Calculators can be obtained free from the company, Beloit, Wis.



One of the important recent accomplishments of J&L Research is the Beeghly analytical method for isolating and determining the percentage of nitrogen and nitrogen-bearing compounds in steel.

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The Magic of Research creates New and Better Steels . . .

THE steels of today are formed and shaped into many products that would have been impossible to fabricate with the steels of yesterday.

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J&L research laboratories are staffed and equipped to undertake every variety of technical problem—from raw materials to the finished products.

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Spotlight on New Methods, Techniques

Three-day conference in Detroit brings together industry experts in both resistance and arc welding. New equipment and techniques demonstrated in two evening sessions

AT THE third conference on electric welding at Detroit the joint sponsors, American Institute of Electrical Engineers, American Welding Society and the Industrial Electrical Engineers Society of Detroit, provided a roster of experts. First two days of the three-day meeting, Apr. 16 and 17, were devoted to extensive coverage of technical developments in resistance welding, climaxed by an evening demonstration session of latest techniques and equipment sponsored by the Detroit section of AWS.

Third day of the conference spotlighted arc welding. In the evening, a second demonstration session was held covering arc welding techniques and equipment.

Quality control keynoted the opening session of the conference: Orderly growth of military spot welding from limited usage in noncritical and nonstructural applications toward full structural application, is the aim of present military specifications, J. Maltz and N. E. Promisel, Bureau of Aeronautics, pointed out in a paper presented at the first session. Largely because of the need for additional design data, use of seam welding for other than noncritical and nonstructural applications is still limited.

Industry's Answer — F. L. Brandt, Thomson Electric Welder Co., Lynn, Mass., discussed fast-growing industry-wide control of quality. Today it is not uncommon to specify welding to ANW specifications and in addition that the welds be crack free. He pointed out trend in welding specifications puts a greater premium on welding machinery and is carried on down into work preparation — cleaning and forming.

Better Instrumentation — Improvement in operation of single phase and three phase resistance welding machines through use of Brush instruments was theme of a paper presented by William R. Stern, Brush Development Co., Cleveland. Mr. Stern explained use of modified direct-writing oscillograph and amplifier for studying sequential firing of ignitron tubes employed in a three phase welding machine.

Unique voltage measuring methods and a new instrument for analysis of voltage fluctuations caused by low frequency type welders were described in a paper prepared by V. H. Kraybill and R. E. Young of Public Service Co. of Northern Illinois and M. Fisher of the University of Illinois. Their investigation disclosed that rotating motor loads may increase welder supply capacity of the power supply system by a significant amount. Investigation required analysis of small voltage variations and led to development of the new instrument.

Spot Weld Monitoring—Great advances in controlling spot weld quality may result from a new instrument announced by Herbert D. Van Sciver, Budd Co., Philadelphia. Mr. Van Sciver described a statistical study of ranges in current, time, electrode force, metal thickness and electrode wear that confirmed the theory that the changing resistance is a predictable function of weld size. First commercial instrument to make practical use of this information is now being tested.

Electronic monitor was developed by General Electric electronic control engineers two of whom, W. B. Hills and S. S. Barnhart, described the development.

New Three-Phase System—Of interest to aluminum fabricators is a new three-phase resistance welding system reported by H. W. Van Ness and E. C. Hartwig, control engineering department, Westinghouse Electric Corp., Buffalo. System incorporates all features which are necessary for obtaining the highest quality welds. Features of little or no value in aluminum welding are eliminated.

Extensive welding tests of the system were made over a wide range of thicknesses and types of aluminum. Advantages reported are consistent crack-free welds exceeding military specifications, and reduced tip pickup, permitting a greater number of satisfactory welds before electrode maintenance is required. Authors of the paper pointed out that electrically speaking, the system has a more even distribution of load among the three phases of the supply. Reduced power demand and improved power factor are claimed for the system, as well as better ignitron utilization, giving more power for same number of ignitrons.

Platen Control—Research conducted at Rensselaer Polytechnic Institute on flash welding resulted in development of a new method of controlling platen-displacement vs time. W. F. Savage and E. E. Moyer of R.P.I. in their paper presented at the conference, discuss design and construction of an all-electronic system that was applied to an existing welder. A ¾-hp shunt-wound dc motor was substituted for the original 1 3-hp, 3-phase motor in the welder.

A voltage signal proportional to platen velocity was obtained from a small tachometer generator. This signal was compared to a reference voltage so that the difference voltage actuated the grid control on the thyratrons which furnished the adjustable voltage by which the motor's speed was determined. If this reference voltage was maintained constant, platen velocity remained constant. But if the reference voltage was varied linearly with time, a parabolic displacement-time curve was obtained at the platen. By maintaining the reference voltage at a suitable low value during the initial closure period, a slow, constant velocity of approach was provided until the first pulse of flashing current. Pulse actuated a circuit to release the reference voltage and to allow it to increase according to the prescribed pattern which determined and controlled the pattern of acceleration of the platen.

Using this system, it is possible to duplicate flashing patterns with an error of less than 2 per cent of the calibrated values on the control dials.

Continental

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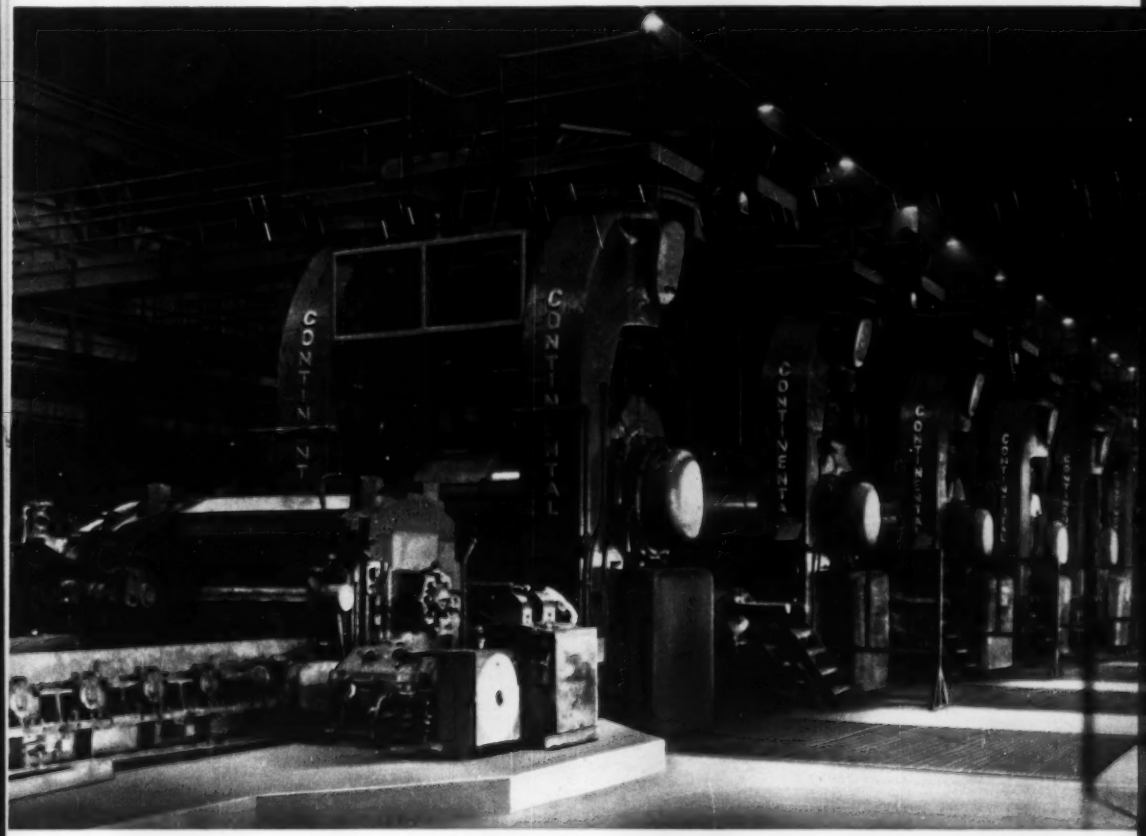

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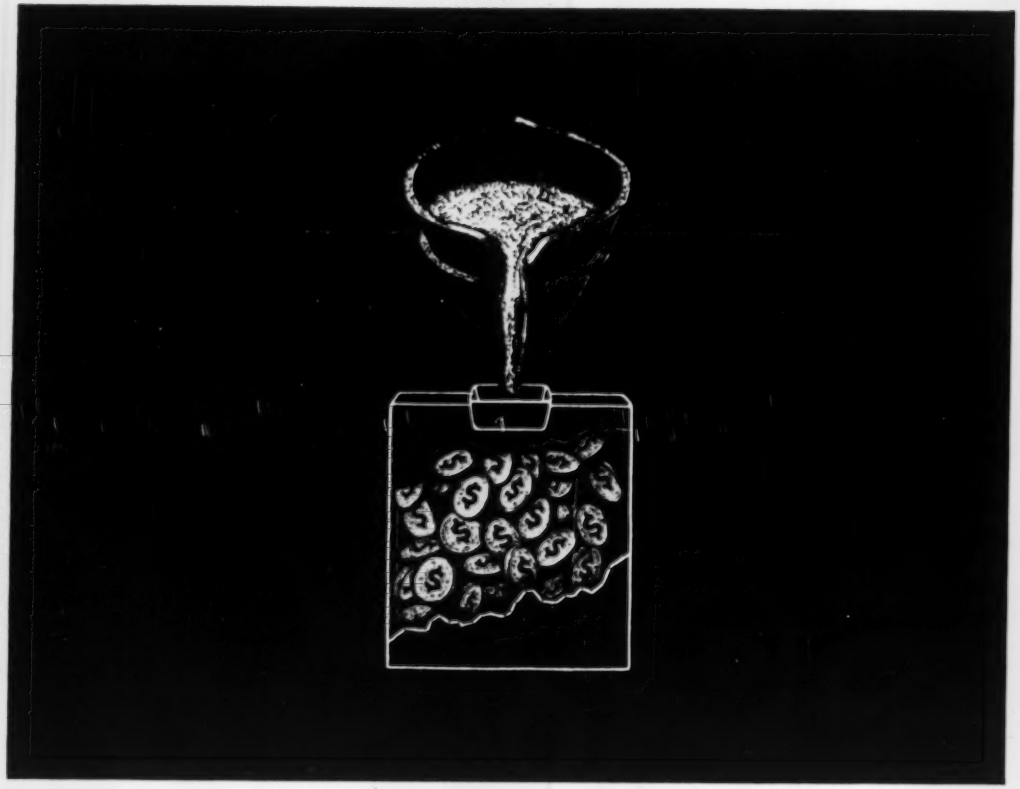

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Using molds and cores of fine-grained sands bonded with BAKELITE Phenolic Resins, the shell molding process yields ferrous and non-ferrous castings that are almost pattern-smooth. Casting tolerances are as close as .003 to .005 inches per inch. Properly applied to your needs, this process can speed output, save time and money, break production bottlenecks.

Be sure to investigate it when you're making plans. We'll be glad to send you more information about the shell molding process, and about the BAKELITE Phenolic Resins developed for it, if you'll write Dept. DP-49.

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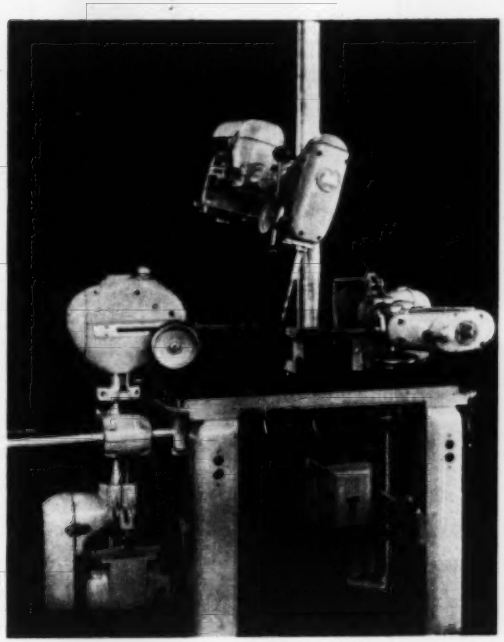
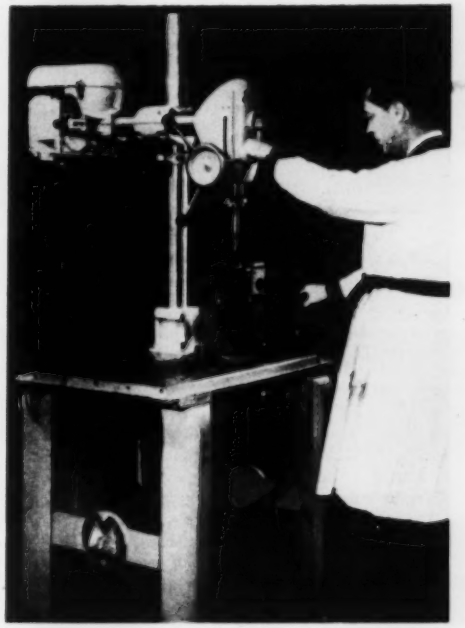


Setup of three units for multiple drilling on three planes



One drill unit performs conventional drilling operation

MULTIPLE DRILLING: New Machine Adds Flexibility

Versatile drill will do conventional jobs, or can be quickly adjusted for a variety of multiple drilling operations

MULTIPLE drilling operations on more than one plane without a special purpose machine is advantage of a new machine called the Magna drill, developed by Magna Engineering Corp., Menlo Park, Calif. Quick, accurate setups are possible with the tool for an unlimited variety of jobs. In fact, manufacturer states applications of the drilling machine are limited only by the imagination of industry.

Basically the Magna drill consists of a number of standardized adjustable drill heads that are mounted on joint castings and precision ground steel tubes. Mounting arrangement permits complete flexibility in locating any number of drilling axes independent of each other, according to the requirements of a particular job. Drill removes former limitations on location of drills in relation to work. One or more drill heads can be quickly set to drill to the center of a sphere from any point on surface of sphere, operating singly, in unison or in sequence.

Modular Table — Contributing greatly to flexibility is the Magna drill's table. Basic drill heads can be mounted around the table in any position the part requires. Table has integral coolant troughs front and rear, machined and dowel drilled ends. Butting basic modular tables together, using either single or double spindle sizes permits any length table required. Basic tables assemble and disassemble quickly.

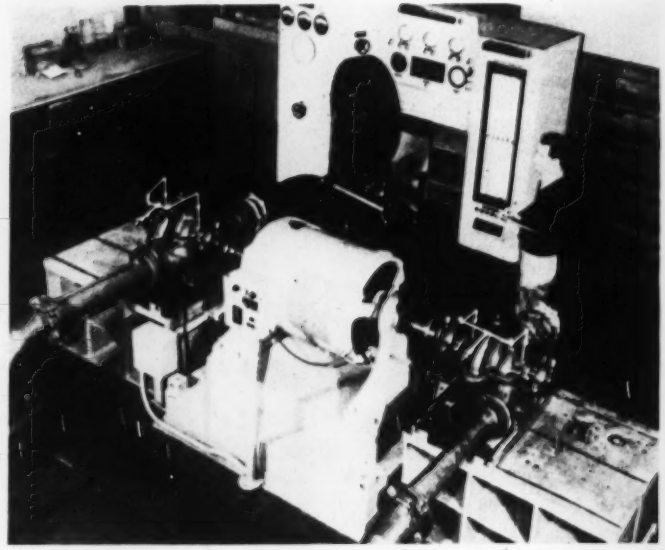
Each spindle around the table operates individually with the proper revolutions per minute, correct feed rate, preset drilling pressure and depth limitation for the operation it performs. Heads will take any attachment and perform any operation practical on a conventional drilling machine.

Detachable Power Feed—Power feed is self-contained, can be attached to any Magna drill head in a few minutes. It has a solenoid release for multiple drilling, and can be set for continuous cycling and for manual overfeed to power engagement at any depth. Drill point pressure is adjustable from 100 to 1000 pounds.

Drill is sold as components so that basic elements can be obtained in combinations that best suit individual requirements. Elements are the drill head, supporting column and base, modular production table and the power feed.

Pump Test Costs Reduced

Test stands are permanent installations with a double-ended, electric dynamometer mounted on an automatic lift between two prealigned pump bedplates



Stations permit duplication of customer's operating conditions. Need for theoretical considerations is eliminated. Unit adapts for all size pumps

COST of centrifugal pump testing is reduced 75 per cent at the De Laval Steam Turbine Co., Trenton, N. J., thanks to new testing stations. These stations duplicate performance for pumps of all sizes and ratings.

Designed for production testing they are also used for research and development. Stands are permanent installations consisting of a double-ended, electric dynamometer mounted on a hydraulic lift located between two prealigned pump bedplates. Powered by an electric motor operating through a self-locking gear train, the lift is controlled by pushbuttons. One station can test pumps up to 6-inch diameter discharge and requires the dynamometer to be set at various heights for the various size units. Signal lights and safety controls are built in for the dynamometer lift.

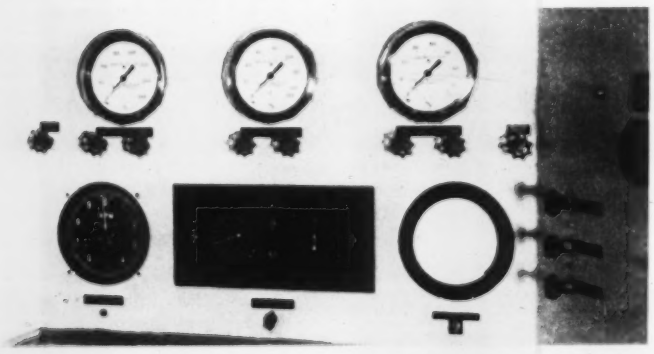
Aligning Time Cut Pumps of one rotation are coupled to one end of the dynamometer shaft while pumps of the opposite rotation are coupled to the opposite end. Dynamometer has specially constructed sliding type couplings with permanently mounted bolts. Pumps are automatically aligned laterally when set on the pads. Equipped with special clamping and alignment fixtures, the pads reduce aligning time to a matter of minutes.

Test station features a system of piping which simulates actual field installation. Suction piping includes a movable manifold submerged in a swirl or vortex-free pool of water. The interconnected reservoirs of water have a capacity of 400,000 gallons. Eccentric pipe reducers provide means of piping pump suction to the manifold and quick connecting adapters are used for pipe connections. Water is discharged through a specially constructed flexible hose carrying the liquid into a pipe system below the operating level.

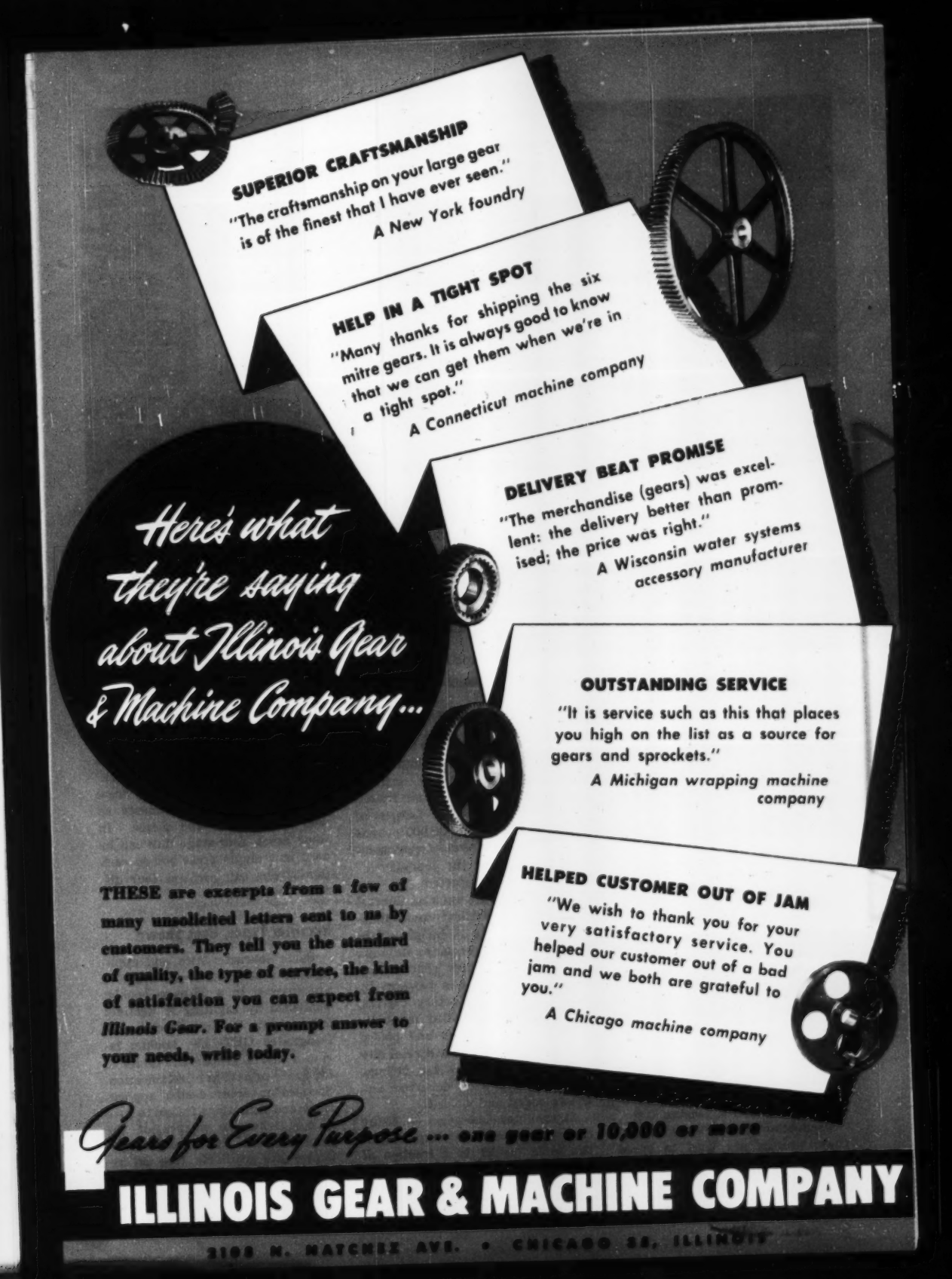
Water is then metered through a bank of venturis that can be operated singly or in parallel. System head is low; by use of a motor-operated valve, additional friction is created so pumps are tested over a wide range of heads. Pipe system requires no priming and is free of air locks.

Desk Controlled Unit—An engineer operates the unit and conducts test from a control desk and panel containing sensitive and accurate test instruments. Before starting the test, the engineer reads the order card that states complete hydraulic data: Discharge pressure, suction head, rate of flow, specific gravity, submergence and horsepower required. Motor data are also given. Customer's operating conditions are then simulated at the control desk.

Calculation of test results can be made without the need of theoretical corrections. This is assurance that the pump has met specified conditions.



Test engineer operates the test station and conducts the running test from the control desk and panel. Instruments and gages record the running data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"The craftsmanship on your large gear is of the finest that I have ever seen."
A New York foundry
HELP IN A TIGHT SPOT
"Many thanks for shipping the six mitre gears. It is always good to know that we can get them when we're in a tight spot."
A Connecticut machine company
DELIVERY BEAT PROMISE
"The merchandise (gears) was excellent: the delivery better than promised; the price was right."
A Wisconsin water systems accessory manufacturer
OUTSTANDING SERVICE
"It is service such as this that places you high on the list as a source for gears and sprockets."
A Michigan wrapping machine company
HELPED CUSTOMER OUT OF JAM
"We wish to thank you for your very satisfactory service. You helped our customer out of a bad jam and we both are grateful to you."
A Chicago machine company
Here's what they're saying about Illinois Gear & Machine Company...
THESE are excerpts from a few of many unsolicited letters sent to us by customers. They tell you the standard of quality, the type of service, the kind of satisfaction you can expect from Illinois Gear. For a prompt answer to your needs, write today.
Gears for Every Purpose ... one gear or 10,000 or more
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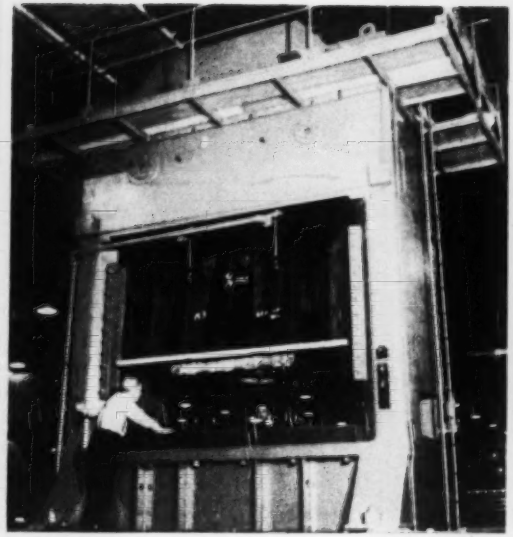
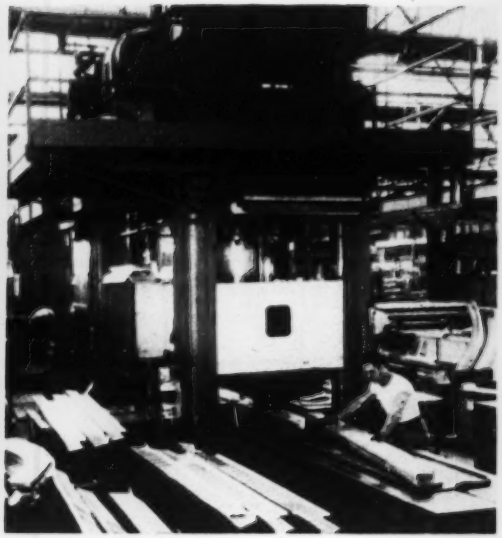


This 600-ton press is one of four eccentric-geared Warco units installed by Ryan Aeronautical Co. to blank and pierce large stainless components for jet engines



Stamping facilities include hydro presses of all types for forming operations. This Williams-White model is turning out intricate webs for Boeing C-97 floor beams

Aircraft Stamping: No More Bits, Pieces

Big presses further one-piece fabricating trend. Components maker installs four more units to speed production of jet engine high temperature structures

PRODUCTION trend toward fabricating large, single-piece aircraft components is emphasized by arrival of four big Warco stamping presses at Ryan Aeronautical Co., San Diego, Calif. This move away from forming structures by joining innumerable small parts — the bits and pieces era — is limited now by availability of large presses and new designs. Ultimately, the newer philosophy may save million of man-hours and tons of machined materials.

Made by Federal Machine & Welder Co., Warren, O., the four units bring Ryan's fabricating facilities to 25 presses ranging in capacity from 30 to more than 1000 tons. They include machines that can perform all four major press functions: Blanking, forming, drawing and squeezing.

Production Booster — At Ryan, these presses are used to speed production of jet engine high temperature structures. Capable of exerting a maximum 600 tons pressure, they provide high-speed stamping of parts for exhaust cones, transition liners, air frames and other components. Largest of the four — weighing 230,000 pounds — is the biggest piece of equipment ever installed by the company.

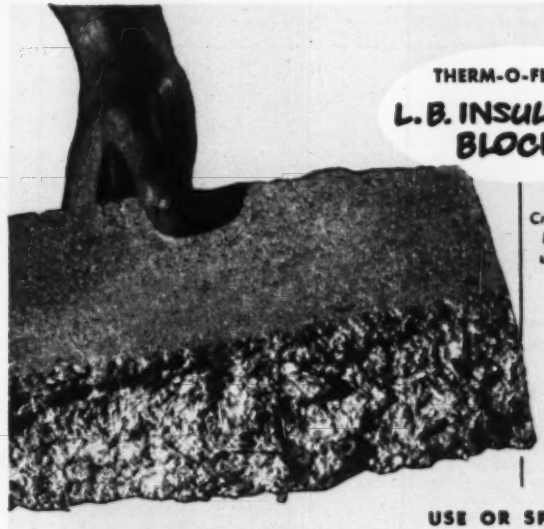
Advantages reported by the parts maker in its work on General Electric J-47 exhaust cones illustrate the benefits of one-piece fabrication. Formerly, large stainless steel skins for these cone assemblies had to be cut in patterns by power shears and rotary cutters. Then they were drilled manually with radial-arm drills and placed in punch presses where special dies blanked the cut-outs for fittings. Finally, holes were deburred and sheets rolled and welded.

Streamlined Operation — Using the largest press, the company gets the same results in a fraction of the time. Stainless sheet is located on 6 tons of dies in the 4 x 9-foot press bed, then blanked and pierced with high precision. Deburring is held to a minimum by close-fitting dies that shear cleanly with little burr residue.

Production planners are capitalizing similarly on the presses' flexible power to streamline production of J-47 combustion chambers, aft frames and afterburner parts. Machines will be used to form, draw and emboss these components as well as to blank and pierce. In some cases, four-stage dies can be used in a single press bed so each ram stroke can perform four different operations.

Rectifier Types, Uses Shown

Basic characteristics and applications of selenium rectifier stacks are covered in a 28-page booklet published by Lighting & Rectifier Department, General Electric Co. Designated GET-2350, booklet includes charts, graphs and tables to illustrate principles of rectification. Sections on circuit design, applications and definitions follow to give a comprehensive picture of the product and its manufacture. Copies are available free on request to the company, Schenectady 5, N. Y.



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L.B. INSULATION BLOCK

Insulation block with high insulating efficiency and structural strength. Includes calcined diatomaceous silica, exfoliated vermiculite and asbestos fibre, strongly bonded with a water resistant binder and laminated by an exclusive molding process. In standard or made-to-order shapes for flat or curved surfaces. Weighs about 22 lbs. per cubic foot.

Cross-section view, broken to show unique structure.

THERM-O-FLAKE

COATING

Insulating cement for exposed furnace brickwork which reduces heat radiation and seals out cold air infiltration. Sticks tightly to basic, silica or fire clay brick. Covers up to 1900 square feet one inch thick per ton.

USE OR SPECIFY

THERM-O-FLAKE

HIGH TEMPERATURE

INSULATION

FOR TEMPERATURES UP TO 1900° F.

THERM-O-FLAKE

GRANULES

Selected quality, exfoliated vermiculite screened for loose fill use, or as aggregate for refractory concrete. Regular granules weigh about 6 lbs. per cubic foot—refractory concrete granules weigh 9 to 11 lbs. per cubic foot.

THERM-O-FLAKE

CONCRETE

Insulation concrete completely prepared and ready for use with addition of water. Has double the insulating efficiency of ordinary insulating concretes. Weight about 40 lbs. per cubic foot. No clay, grog or cement to be added.

THERM-O-FLAKE

BRICK

Molded vermiculite brick for back-up insulation of vertical walls of open hearth and other furnaces. High insulating efficiency and stability. Very light weight, about 16 lbs. per cubic foot.

Write For New Folder!

ILLINOIS CLAY PRODUCTS COMPANY

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Goose Lake **FIRE BRICK CLAY**—Excellent resistance to slags, spalling and abrasion.

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Goose Lake **FIRE CLAY FLOUR**—Finely pulverized all-purpose fire clay.

Goose Lake **TAP HOLE MIX**—Made from Goose Lake Fire Clay and first quality fire brick—ground and screened together.

BLAST FURNACE PRACTICE . . . *The Raw Materials Problem—IX(b)*

Early ironmasters using local ores recognized the importance of stock preparation in the shaft before delivery to the smelting zone. Substitution of Lake ores for native ores and the structural strength of coke led to higher blast furnaces and faster blowing. Advantage of Lake ores traced to particle size

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operations
Cleveland

IN 1853 a few tons of Lake ore were shipped from the Jackson mine at the Marquette range in the Upper Peninsula of Michigan to the Sharpsville furnace, Sharpsville, Pa. At that time the blast furnace was owned and operated by David and John P. Agnew. When James M. Swank was gathering data for his book *Iron Making and Coal Mining in Pennsylvania*, published in 1878, a counter claim for being the first to "successfully" use Lake Superior ore in a blast furnace was advanced by Mr. Frank Allen who had been manager, in the 1850's, at Clay furnace, located near Sharpsville furnace. Swank published statements by both Messrs. David Agnew and Allen who had entered into a local newspaper controversy regarding their respective claims. David Agnew was a great-grandfather of the author of this article. In a file of family papers there is a letter written to David Agnew by his brother John P. Agnew, at the time of the newspaper controversy, which is herewith reproduced because it contains some heretofore unpublished details concerning the first use of Lake Superior ore which are believed to be of historical interest, and also it indicates the attitude of middle west blast furnace operators of that era regarding possibilities of using iron rich ore in a blast furnace.

Heat Is Required—Because of scientific research we now know production of slag will require more heat than production of an equal weight of iron, but it is apparent from the letter that furnace operators of 100 years ago thought the opposite. Also, apparent from the letter, in 100 years there has been no change in the differences of opinion of blast furnace operators regarding the effect of raw materials on their operations which could be discouraging to anyone trying to advance a new idea and having only one life time in which to do it.

Reference to the trial of Lake Champlain ore, as well as Lake Superior ore, is evidence that management of middle west furnaces a century ago had a raw material problem similar to the one of the present era, and, since the earlier problem was solved with the development of operating practice methods suitable to the character of raw materials used, it is reasonable to believe the same approach to the problem of the present era will solve it also. The letter follows:

Alexandria, Va.,
February 3rd, 1877

Dear Brother,

I notice Mr. F. Allen's article published in the Sharpsville paper, headed, "The First Successful Working of L.S. ore in Sharpsville" and am greatly surprised at its contents. Also I am sorry to have to contradict his statements as to the successful working of the first trial ever made to convert Lake Superior ore into pig iron. All the circumstances connected with that event are as fresh in my memory as if they had transpired within the last month.

At the time he refers to (1853) which I think is the correct date, the Sharon Iron Co. at this time was badly needing additional capital, and "General Curtis" its president thought if he could demonstrate that Lake Superior ore could be converted into pig iron it would enable him to sell stock of the company and thus relieve it of its embarrassment.

At the period referred to it was the common opinion among furnacemen that ore yielding 45 per cent iron was too rich to be worked in a blast furnace, or in other words to be rendered fluid

Other articles in this series appeared in these issues of STEEL:

I Operating Theories, Dec. 10, 1951, page 102
II Thermal Requirements of Shaft, Dec. 24, 1951, page 66
III Hearth and Bosh Reactions, Dec. 31, 1951, page 62
IV Influence of Coke Ash on Thermal Effects, Feb. 4, 1952, page 98
V Comparison of Operating Data, Feb. 11, 1952, page 97
VI(a) Generation, Recovery and Use of Heat, Feb. 11, 1952, page 112
VI(b) Generation, Recovery and Use of Heat, Feb. 25, 1952, page 88
VI(c) Generation, Recovery and Use of Heat, March 10, 1952, page 118
VI(d) Generation, Recovery and Use of Heat, March 17, 1952, page 98
VII Comparative Values of Fluxing Stones, March 24, 1952, page 90
VIII Slag Composition Research, March 31, 1952, page 86
IX(a) Raw Materials Problem, April 7, 1952, page 121

Another expansion OF McKEE DESIGN, ENGINEERING AND CONSTRUCTION FACILITIES

THIS new wing will add approximately 26,000 square feet of space to the McKee Building—space for further enlargement of our engineering staff.

Expansion is not new at McKee. The addition you see under construction is the third enlargement of our Cleveland headquarters, the seventh increase in engineering space here and in other cities since 1939.

This is no mushroom growth. It is part of a steady expansion program with future additions already planned to keep pace with increasing demands for McKee engineering services.

DESIGN, ENGINEERING AND CONSTRUCTION FOR THE IRON AND STEEL AND PETROLEUM REFINING INDUSTRIES

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and thus capable of being made into pig iron, and I know positively that Gen'l Curtis got no encouragement (except from ourselves) that the desired result could be accomplished.

When he asked us if the Lake Superior ore could be converted into pig iron we told him we had no doubt of it, at which he was greatly delighted, and asked if we would agree to make the experiment if he furnished the ore. We told him we would. He thereupon ordered down the ore (I think about 30 tons) which however cost about as much delivered at our furnace per ton as pig iron was worth. At the time it was subject to long wagon transportation. This ore was worked through our furnace very successfully, indeed our furnace never gave better results than while working this ore. We commenced by charging ¼ L.S. and ¾ common ore, then increased to ½ L.S. ore, then ¾, and finally to the full L.S. charge. The iron produced was worked at the Sharon rolling mill, into boiler plate, bar, nail rods, nails and spikes, etc., which was shipped to New York and there subject to the usual tests, and declared to be of the very best quality and therefore Gen'l Curtis was enabled to sell stock.

D. and J. P. Agnew are most certainly entitled to the credit of having first produced pig iron from Lake Superior iron ore and did it successfully and in the face of the opinion of all furnacemen of that time as far as I am aware. This ore never having been utilized before, except being bloomed, the iron however made by this old mode never was valuable, being flawic and defective and I suppose at this day would not be marketable.

I can't now say whether I ever met Mr. Allen or not but can most positively say that I never intimated to him or any one else that our experience in working Lake Superior ore was not satisfactory. On the contrary my great regret has always been that we could not have held on until this ore could have been as accessible to us as it became to our successors.

The first lot of Lake Superior ore ever brought to Mercer county was worked through our furnace, if any was brought down at a later date and divided between ourselves and the Clay furnace I have no remembrance of it. I think Mr. "A" must have confounded Lake Champlain ore with Lake Superior. We were the first also to work L. Champlain ore in connection with the common ores of Lawrence and Mercer counties, Pa.

I think if Mr. Allen will take the trouble to refresh his memory as to circumstances and dates he will correct his statements. It was quite easy for Mr. Allen or others to make the egg stand on end after they were shown how to do it.

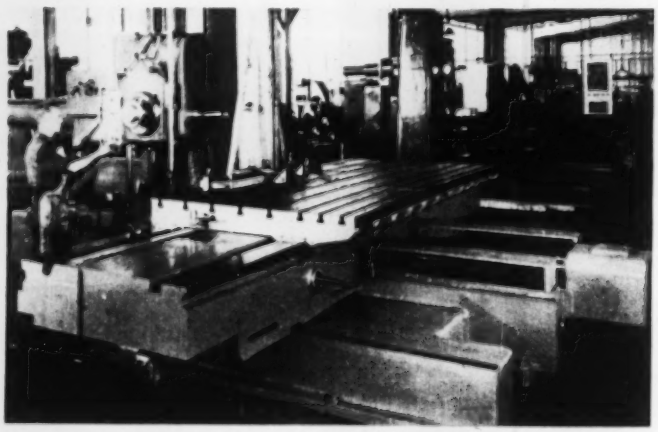
Your affectionate brother,
John P. Agnew

Although the first shipment and use of Lake ore was made in 1853 the great influence it was destined to have on the industry and on furnace practice methods, was not to be fully demonstrated for another quarter century, with the greatest influence being after the development of the Mesabi range, which began in the early 1890's, and with the established use of bituminous coke for fuel.

Effect of Hot Blast—Improved means for heating the blast (Cowper brick stoves, 1860) assured the control of "critical hearth temperature" and thus increased the smelting capacity of the bosh and hearth operation by making possible the use of a heavier ore burden than had been possible with facilities formerly available. But to prepare a heavier ore burden the preparation capacity of the furnace shaft had to be increased and furnaces were built higher, thus giving longer contact between the gas and stock in the furnace shaft. This trend in furnace construction was in evidence before the use of Lake ores as indicated by the somewhat greater height of the Sharpsville furnace compared to the Cornwall furnace. Some furnaces of the Sharpsville furnace era were built to a height of 45 feet.

This step marked a definite change in the furnace practice method, and without being recognized for what it was, it served as a practical demonstration of Johnson's 2-thermal equation theory since there was the recognition of a need for stock preparation before delivery to the smelting operation. It is reasonable to say that from the earliest times with the use of charcoal and cold blast, the limited smelting capacity of the bosh and hearth operation had obscured the importance of the related shaft preparation capacity because the capacity of the short shaft was more than enough to prepare all the burden the bosh and hearth could smelt with cold blast. But with additional heat from the hot blast, and increased preparation requirements for Lake ores, a greater preparation capacity in the shaft of the furnace was needed.

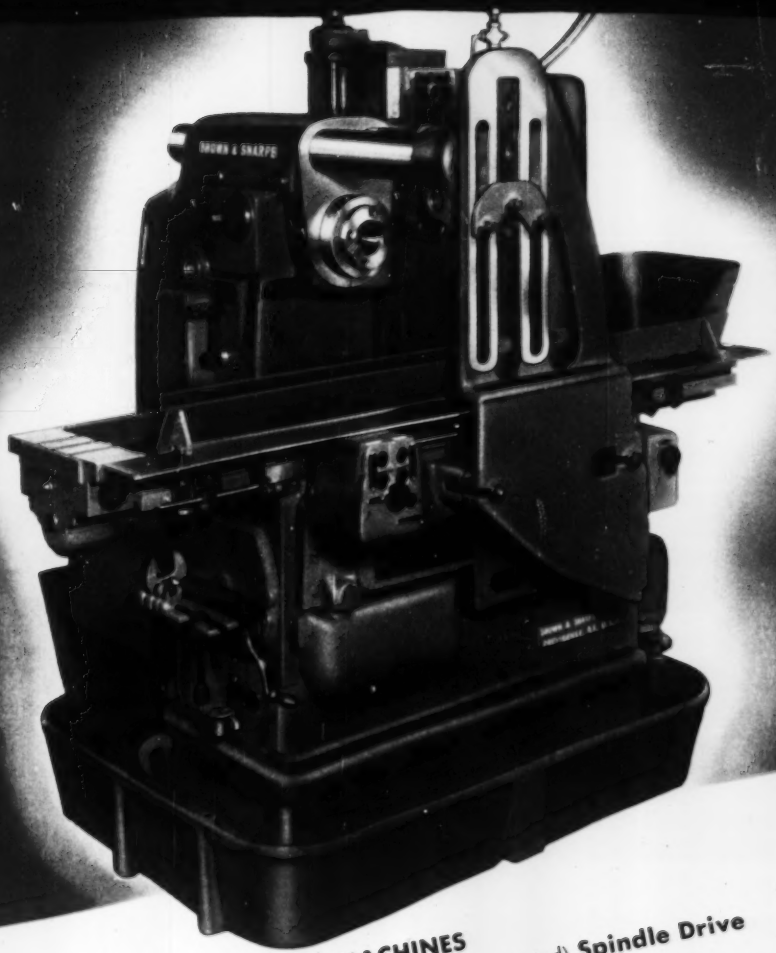
Steel shells made possible the construction of furnaces to any desired height relatively simple, the structural strength of bituminous coke enabled it to support the weight of the burden in higher stacks, and the combination of the



Horizontal Giant Means Greater Interchangeability

Buhr Machine Tool Co. installed this big boring mill to achieve facilities to do its own work on main bases and large castings at the Ann Arbor, Mich., plant. Greater interchangeability on large parts is the result. The automatically-positioned, horizontal Lucas has 84-inch vertical and 134-inch table travel

Productioneered
for Long-or Short-Run Milling



No. 12 PLAIN MILLING MACHINES
3 and 7½ h.p. (Illustrated) Spindle Drive

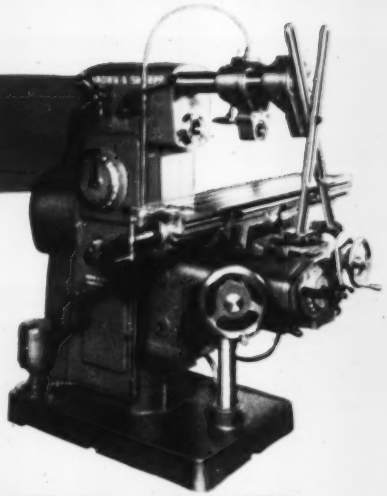
Designed throughout for higher productivity of medium-size precision parts, these machines are "Productioneered" to pay off in maximum production for you.

Time-saving, high-precision features include: complete electrical control of all power movements; wide variety of automatic cycles with dual feed rate; automatically-released backlash eliminator that permits climb-milling in either direction.

See next page for other Brown & Sharpe "Productioneered" Milling Machines.

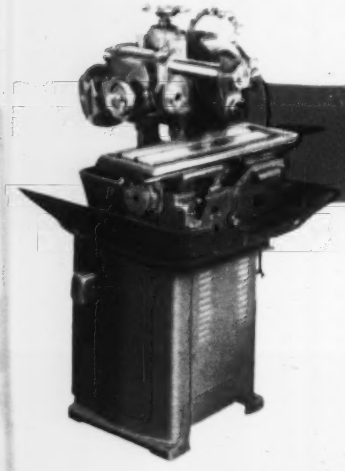
Brown & Sharpe

Productioneered
for greater flexibility



No. 2 Plain Milling Machine, 5 h.p.

Tri-motor drive, column-and-knee type design and extended spindle face give this machine additional set-up and handling flexibility . . . permit exceptional operating efficiency. (Same features in 3 h.p. machine).

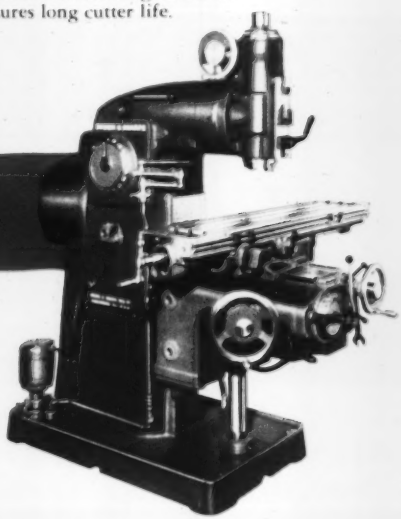


Productioneered
for economical, fast production of small parts

No. 000 Plain Milling Machine

Simple set-up, fast operation, consistent accuracy for production of small parts for firearms, radios, sewing machines etc. Uniform positive feed assures long cutter life.

Productioneered
for versatile vertical milling



No. 2 Vertical Milling Machine, 5 h.p.

In addition to the usual features of a vertical, this machine incorporates the versatile swiveling head, making it possible to mill or drill at angles, either by hand or power, and without special fixtures. (Same features in 3 h.p. machine.)

Write for specifications of these machines or information on any other Brown & Sharpe product. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

Brown & Sharpe

Milling Machines • Grinding Machines • Screw Machines • Cutters • Machine Tool Accessories
Machinists' Tools • Electronic Measuring Equipment • Johansson Gage Blocks • Permanent Magnet Chucks • Pumps

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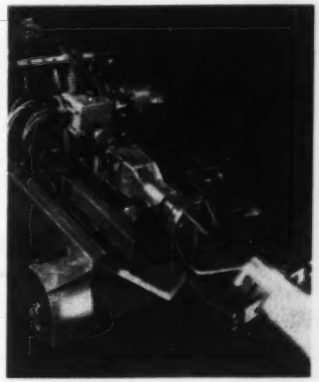
two items permitted faster blowing rates.

Before the use of Lake ores virtually all local ores used were of a lumpy character, and covered a range of magnetite, limonite, hematite, and carbonite iron oxides[12]; magnetite predominating in the east and carbonate in the middle west, with a wide range in the content percentages of iron and gangue. It is characteristic of lump ore to carry less surface moisture than fine ore because of the difference in the ratio of surface to mass. The majority of eastern district magnetite ores are virtually free from surface moisture and combined volatile matter, some containing small percentages of volatile sulphur. Natural hematite ores contain less combined volatile matter than either limonite or carbonate ores.

Absorption Period Increased— Because of these characteristics, the shaft operation of preparing ore for smelting would vary greatly, with time required for lump ore to absorb heat being the principal factor. Because of the small ratio of surface to mass with lump ore, the heat absorption rate would be slow and the shaft preparation capacity would be limited by the mechanical conditions governing the gas-solid contact and the transmission of heat from gas to stock rather than by the amount of heat required. The amount of heat required by the respective materials would vary with their chemical composition but the different requirements would be obscured by the limited opportunity for heat recovery due to particle size of materials.

Lake ores introduced to the furnace operation the factor of ore fines to a greater extent and with it there was a greater percentage of *heat recovery* with advantage to the furnace productive capacity and fuel rate. Frequently the total percentage of surface moisture and combined volatile matter content in Lake ore was greater than in local lump ore; consequently, the volume of heat *required* for preparing a pound of such Lake ore for smelting would be greater than it would be for a pound of local lump ore, but the *advantage* of Lake ore fines to the *rapidity of heat absorption* and the *percentage of heat recovery* more than offset the disadvantage of the increase in the volume of heat required.

[12] "History of Mercer County, Pa., 1909, by J. G. White.



Tight Grip on Hot Stock

Better maneuverability and more secure grip with hot stock during forging should result from modifications reported in its Auto-Floor Manipulator by Salem-Brosius Inc., Pittsburgh. Company improved wedge action design in workholding tongs mechanism and added positive positioning in shoes

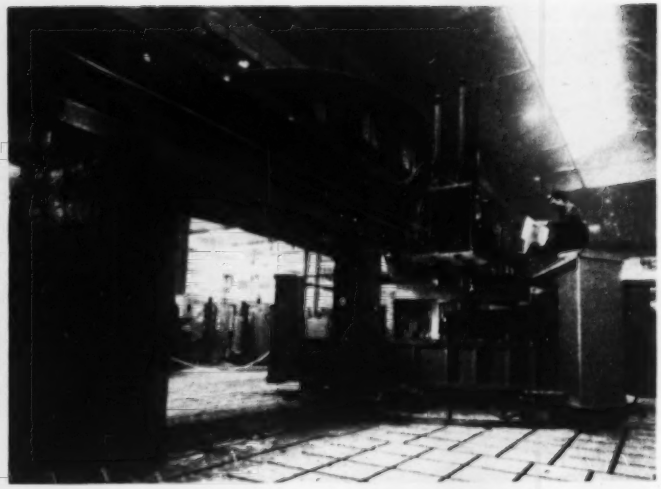
First Lake ores used were from the Old Range which characteristically were mixtures of coarse, plastic, and fine ore, which made the particle size range more favorable to the gas-solid contact than had been possible with all local lump ore, and permitted an increase in the burden weight. Moreover, the conditions described permitted faster blowing rates because of the *increased need for heat* in the shaft operation, caused by the greater volatile matter in Lake ore, and by the increased weight of burden.

The increase in the burden weight and blowing rate would inevitably increase the production and reduce the fuel rate. The uniformly higher iron content of early Lake ores used (plus or minus 60 per cent Fe), compared to the low content of most native ores used in middle west furnaces (plus or minus 30 per cent Fe), greatly reduced the weight of slag produced per ton of iron. Comparison of the heat balance data indicates that the amount of heat required per pound of slag is always much greater than it is per pound of iron produced with the slag. Consequently, when the use of iron-rich Lake ore lowered the weight of slag produced per ton of iron there was enough additional hearth heat made available to take care of the increased weight of iron smelted in the bosh and hearth as well as an excess for delivery to the shaft to do the increased work there.

But the advantage of reduced slag production did not account for improved furnace practice when compared to eastern furnaces using naturally iron-rich magnetite ores of equal Fe content as naturally-rich Lake ores. In that comparison the pre-eminent advantage of Lake ores lay in the ability of the fine particle size to more rapidly and efficiently *recover heat* than the hard, dense, lump magnetite ores.

Phase Not Recognized — With the slag advantage cited there was another practical demonstration of Johnson's 2-thermal equation theory and the influence of *available hearth heat*, but instead of being recognized for what it was there was a widespread belief that Lake ores were more easily *reduced* when it would have been a better choice of words to have said that iron was more easily *produced*. Although hematite oxide (Fe_2O_3, 70 per cent Fe) requires less heat for reduction than carbonate ($FeCO_3$, 48.2 per cent Fe), or limonite ($2Fe_2O_3$-$3H_2O$, 59.8 per cent Fe), it requires more than magnetite (Fe_3O_4, 72.4 per cent Fe). Comparison of the heat balance data indicates that these slight differences in the thermal requirements for Fe reduction are of minor importance in the overall operating economy of blast furnace operation.

But at the time Lake ores came into use their prevailing physical condition was more favorable to the reception of heat than the prevailing condition of other natural ores used and the false conception of the easier reducibility for hematite oxide has had wide credence since. In the light of the knowledge now available from scientific research and practical demonstrations of actual furnace operations,



Precision Machining Over a 42-Foot Cross-rail

Rail-type 42-foot vertical boring mill precision machines huge hydro-generator frames and bearing bracket assemblies. Mill is built so work can rotate on 20-foot diameter table or remain fixed as cutter rotates inside piece. Tool operates at General Electric Co.'s Large Motor & Generator Dept., Schenectady, N. Y.

as for example, the eastern magnetite furnace operations, it seems clear that the advantage of Lake ore was due to the particle size rather than to the form of iron oxide.

Basic Tonnage Predominated—Development in the use of Lake ores was contemporary with the development of the basic open-hearth process for producing steel, and with that development basic iron constituted the major percentage of the grades of pig iron produced by steel plant blast furnaces. For many years the specification for basic iron was under 1.00 per cent silicon and under 0.05 per cent sulphur, with the lowest possible content for both preferred, and it was general blast furnace practice to produce a basic slag to hold down both the silicon and sulphur content in the iron. Prior to this practice, particularly for charcoal furnace operations, it was the general practice to produce an acid slag. Since a basic slag consumes more heat than an acid slag, and requires greater concentration of heat in the bosh and hearth to keep it fluid, the critical hearth temperature of Johnson's theory again comes into prominence.

With the conditions described the pre-eminence in demand for hearth heat made the smelting capacity of the bosh and hearth the limiting factor for furnace productive capacity and relegated shaft operation to a position of secondary importance since the shaft could always prepare more stock than the bosh and hearth could smelt. However, in the first 25 years of the present century the practice of producing basic iron with an acid slag came into general use and that practice again made more hearth heat available the same as if less slag had been produced—and less slag was produced because the increased acid/base ratio for the slag constituents required less fluxing stone. With this addition to the *available hearth heat* more burden could be smelted provided more was prepared for smelting and the capacity of the shaft for preparing the stock then became the limiting factor for furnace productive capacity and the fuel rate.

(To be continued)

Press Pressures Measured

Electronic instrument instantly measures pressures in press during operation and shuts the press down instantly if overloaded. Called the Dieometer, the instrument protects against damage caused by overloading and subsequent loss of production time. It helps avoid injury to carbide dies. Dieometer is made by Henry & Wright, division of Emhart Mfg. Co., Hartford, Conn.

Data Expands on Ductile Iron

Study by National Bureau of Standards expands information on effects of different additives on formation of nodular graphite. Additives investigated were magnesium, magnesite, iron sulphide, calcium, nickel-chromium-molybdenum and boron. In addition to these additives, research included such variable as composition, melting and pouring temperatures and cooling rate.

Results show completely nodular graphite was obtained only in iron containing magnesium in excess of 0.03 per cent. Two nodule types were observed: Radial and structureless—the structureless types frequently having a crystalline core. Results with other additives were essentially negative.

Oval or irregular patches of graphite—not true nodules—were observed in iron treated with magnesia, iron sulphide and boron. Only a few nodules were observed in calcium-treated specimens, but the bureau says this was probably because little calcium was retained. They add that other investigators have reported 100 per cent nodular graphite structures in irons having calcium contents higher than were obtained in this project.

Experimental method involved melting cast irons of various compositions in a high-frequency induction furnace. After melt reached desired temperature, nodulizing agent under study was added. Melt next was inoculated with 0.4 per cent silicon, then cast in round bars. These were examined for hardness.

Magnesium as nodulizing agent was supplied in form of 80 Cu-20 Mg alloy. Effect of cooling rate on microstructure was determined by casting wedge-shaped bars. Cooling rate, greatest near apex of the wedge, was observed at intervals along the bar by means of thermocouples.

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formation, but effect of cooling rate lessened with increased magnesium content. No relation between nodule formation and pouring temperature or maximum heating temperature was observed. Results of the investigation support the belief that nodular graphite is formed in the melt during solidification and that patches are produced after solidification by carbide decomposition.

Sprinklers Fight With Foam

Fire fighting sprinklers using air foam are employed in a protection system at Syracuse, N. Y., plant, Solvay Process Division, Allied Chemical & Dye Corp. Installation is located in the company's chlorination and distillation buildings where benzene and its derivatives are processed.

The company says tests of the equipment illustrate adaptability of Automatic air foam sprinkler systems for hazardous operations. These systems are designed to combine characteristics of automatic sprinklers, water spray and foam fire protection. Design work was done by Automatic Sprinkler Corp. of America using foam developed by National Air Foam Systems Inc. Operation depends on integration of deluge sprinkler equipment and a foam injector.

Instrument Control Summarized

"Fundamentals of Instrumentation for the Industries" covers measurement, control and transmission of variables encountered in industrial operations. The 126-page manual is published by Brown Instruments Division, Minneapolis-Honeywell Regulator Co.

Bulletin prefaces its material with a discussion of values gained by accurate measurement and purposes it serves. Progress in techniques is traced to show how control instrumentation has advanced to function according to industry's needs. The following eight sections cover fundamentals of measurement and control; measurement of process variables; remote transmission of measurements; types of automatic controllers; power units and final control elements; control systems; panelboards; and typical applications.

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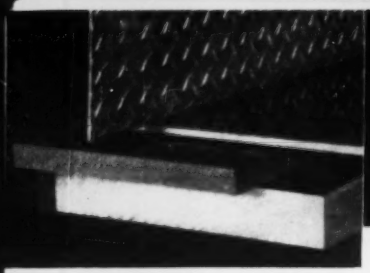

SHEET AND PLATE: Flat and coiled sheet, circles, patterned sheet, plate, tread plate, roofing and siding sheet, roofing accessories and fasteners; specialty sheet.

WIRE: Coiled and straight lengths, rivet wire, flattened and slit wire.

SCREW MACHINE STOCK: All free-cutting alloys plus the higher strength alloys—24S, 61S and 75S.

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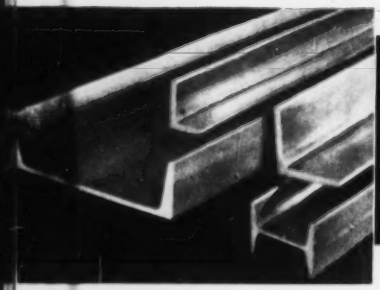
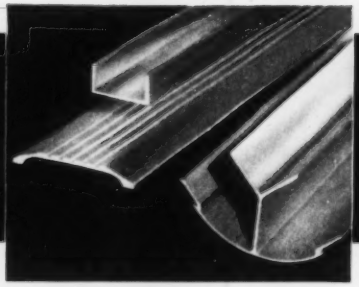
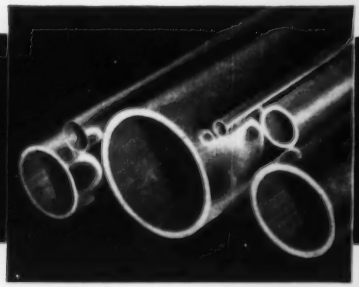


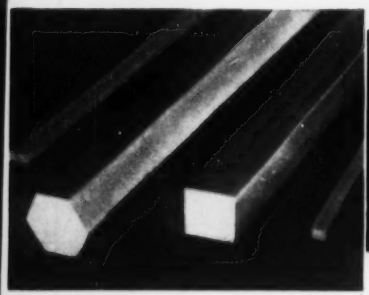
ROLLED SHAPES: Equal angles; unequal angles; channels; I-beams; H-beams; Tees; Zees.



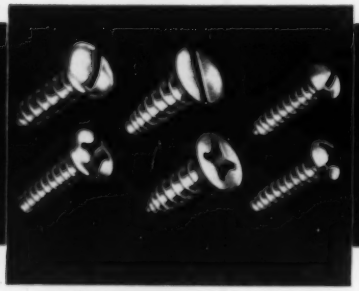
EXTRUDED SHAPES: Miscellaneous extruded shapes such as angles, channels, half rounds, quarter rounds, thresholds, truck corners and structural members, etc. Round, square, and rectangular bars.



TUBE AND PIPE: Coiled tube, straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; irrigation pipe; rigid conduit.



BAR STOCK: Square, hexagonal and rectangular bar stock in free-cutting and higher strength alloys.



FASTENERS: Machine screws; wood screws, washers, nuts, bolts, rivets.

WELDING AND SOLDERING SUPPLIES: Welding and brazing wire; welding and brazing flux; solder flux; solder.

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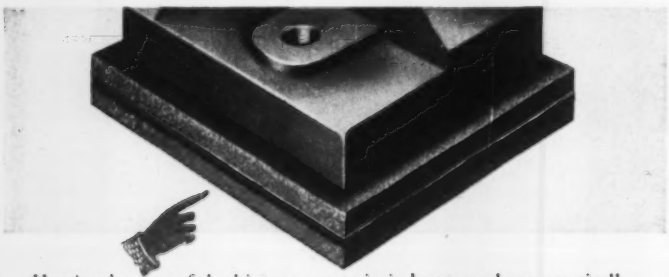

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Preventive Maintenance Shown

Institution of an industrial preventive maintenance program is outlined in a 28-page booklet published by Westinghouse Electric Corp. Booklet discusses general programs designed to reduce production line down time and details function of production power equipment.

Suggested schedule of work and cleaning on power equipment is presented in chart form; more specific information follows in the general body of data. Frequency of inspection and care of equipment are presented with any additional precautions that may have to be taken for specific parts. Maintenance manual will be sent free on request to the company, Box 2099, Pittsburgh 30.

Helical Carbide Speeds Cutting

Standard milling machines can shape structural parts more accurately and rapidly through a cutting tool design reported by Boeing Airplane Co., Seattle. The company claims machining on close-tolerance airplane parts is done almost three times faster as a result of its tool development than was possible with cutters it used previously.

Boeing says its method entails forming carbide cutters so they can be used on helical or spiral tool bodies that previously were limited to steel cutter tool use. Cuts 76 feet long on aluminum alloy wing stiffeners, made in seven minutes, are attributed to the helical carbide unit. Resultant roughest spot on the machined area is only one-thirtieth the thickness of a human hair.

Estimates place time required to perform the same job with a straight-edged carbide at about 20 minutes; 45 minutes if the same part were machined by the high-carbon-steel helical cutter method. In neither case would tolerances be kept as rigidly.

Other advantages include lower power requirement and longer service life between removals for sharpening. Boeing estimates that

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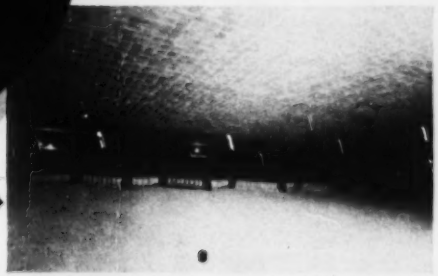

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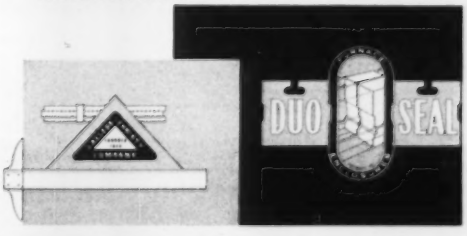

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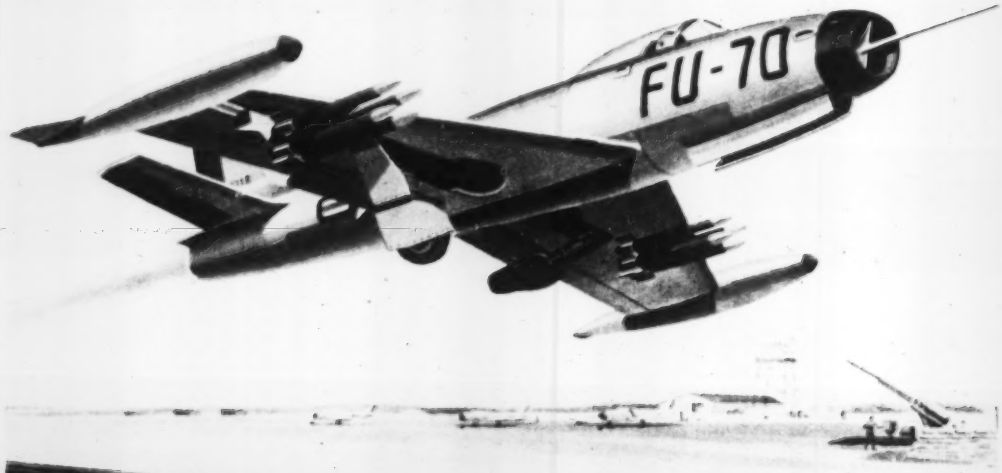

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ASTM Steel Group Reports

Emergency provisions approved for letter ballot and new specifications reviewed at the recent meeting in Philadelphia of Committee A-1 on Steel, American Society for Testing Materials, are published by the society.

Action of the subcommittee on structurals modifies elongation requirements on relatively thin materials, e.g., those below 5/16-inch thick. Committee is inserting in general requirement specification A6 permission to select a specimen at random for retest. Reference to use of malleable iron where agreement has been reached, probably listing grade 35018, is to be inserted in structural steel purchase specification A7.

Forgings subcommittee clarified certain size specifications in general forgings specifications A235, A236 and A237. Proposals to set up check analysis in carbon and alloy billet specifications A273 and A274 drew marked differences of opinion. Although lacking complete agreement, the committee voted to have the society issue new versions of these specifications in tentative form.

Proposed specification for heavy-walled carbon and low alloy steel castings for steam turbines was issued by castings subcommittee for vote. This ferritic material is used for cylinders, valve chests, throttle valves and in other turbine applications. Some changes were recommended in the widely used general specification A27 involving unspecified alloying elements.

Decision to rush emergency provisions permitting conservation of molybdenum was the top action taken by the pipe and tubing subcommittee and the pipe section covering this material for high temperature service. On nominal ½ of 1 per cent Mo grades, a minimum 0.40 limit will be set up; for nominal 1 per cent grades, a minimum limit of 0.80. In requirements A213, A249 and A271, the group recommended requirements for

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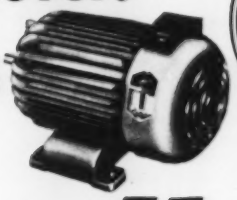

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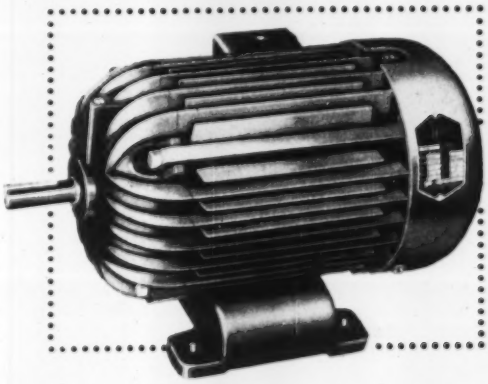

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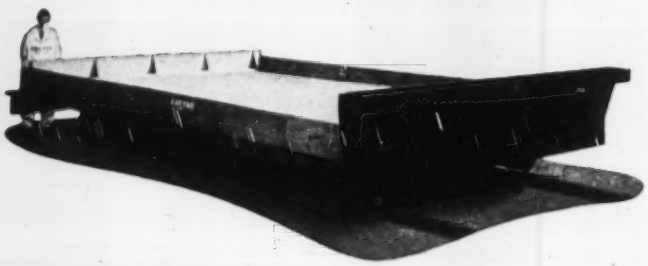

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passivation be removed. Revision in hardness requirements of high silicone grades in A213 was proposed.

Subcommittee on steels for boiler pressure vessels, concerned largely with plate material, revised its 8½ per cent nickel specification. Draft of a 4 to 6 per cent Cr steel plate was approved for ballot. Also authorized was a grade of 2½ Cr-1 per cent Mo plate to be used in conjunction with requirements in the ferrite plate specification A335.

In bar steels, a task force was appointed to review application of boron-treated steels to various ASTM bar steel specifications and consider emergency alternate provisions where they are found practical. A new specification for nitriding steel was approved by the subcommittee. Some Bessemer equivalent grades are being made in the open hearth and electric furnace, and it is planned to add requirements in hot and cold rolled bar specifications A107 and A108.

Work on valves, flanges and fittings for high-temperature service parallels action taken on conservation of molybdenum by the pipe and tubing group. Efforts will proceed on a new specification for welded austenitic pipe similar to fusion-welded pipe requirements for both alloy and carbon grades in specification A155.

Lubricants Progress Traced

Development of lubricants over the past 25 years was traced by W. D. Thomas, American Cyanamid Co., at a recent meeting of the Baltimore section, American Society of Lubrication Engineers. The speaker's paper, "Chemical Addition Agents for Lubricants," showed how use of chemical additives has solved many problems posed by engine design, fuels and operating conditions. Mr. Thomas is technical representative for the company's petroleum chemicals department.

Manual Shows Welding Methods

Different approach to an industrial how-to-do-it publication may be seen in a 16-page manual published by All State Welding Alloys Co., White Plains, N. Y. The firm says its illustrated brazing bulletin is the unedited work of men who

FLAT SPRING STEEL

You can get it now! . . . and we believe it's the best spring steel we've ever made

OUR NEW specialty spring steel plant is in full swing. Equipped with today's most modern, precision machines, we believe we're producing flat spring steel that gives more for your money than ever before.

This new spring steel is tops in uniformity. It saves you preparation time . . . cuts down machine stoppages . . . gives you the greatest number of perfect parts from every foot and pound of steel.

With our greatly increased capacity we can make prompt deliveries on flat spring steel. And if you need high carbon round or shaped wire, ask what we can do. John A. Roebling's Sons Company, Trenton 2, N. J.

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Production of steel strip and tubing to meet modern industry's rigid specifications demands the most modern equipment. During the last 30 years, The Wallingford Steel Co. has kept pace with developments in both machinery and techniques by executing a continuous program of replacement and improvement. Today, not one piece of original equipment is still in use. The two-stand, four-high tandem rolling mill shown above is an outstanding example of the many precision built production machines in our completely equipped plant. Electronic continuous mill gages provide a constant check to holding sheets to extremely close tolerance.

THE WALLINGFORD STEEL CO.

SINCE 1922

WALLINGFORD, CONNECTICUT, U.S.A.

operate the torches. Copies of it are available free from the company's home office or distributors.

Compensator Test Simplified

Quick test for electronic temperature-compensating components is a development of Naval Research Laboratory. The resulting speedup should remove a stopper from equipment manufacturing processes, says Office of Technical Services.

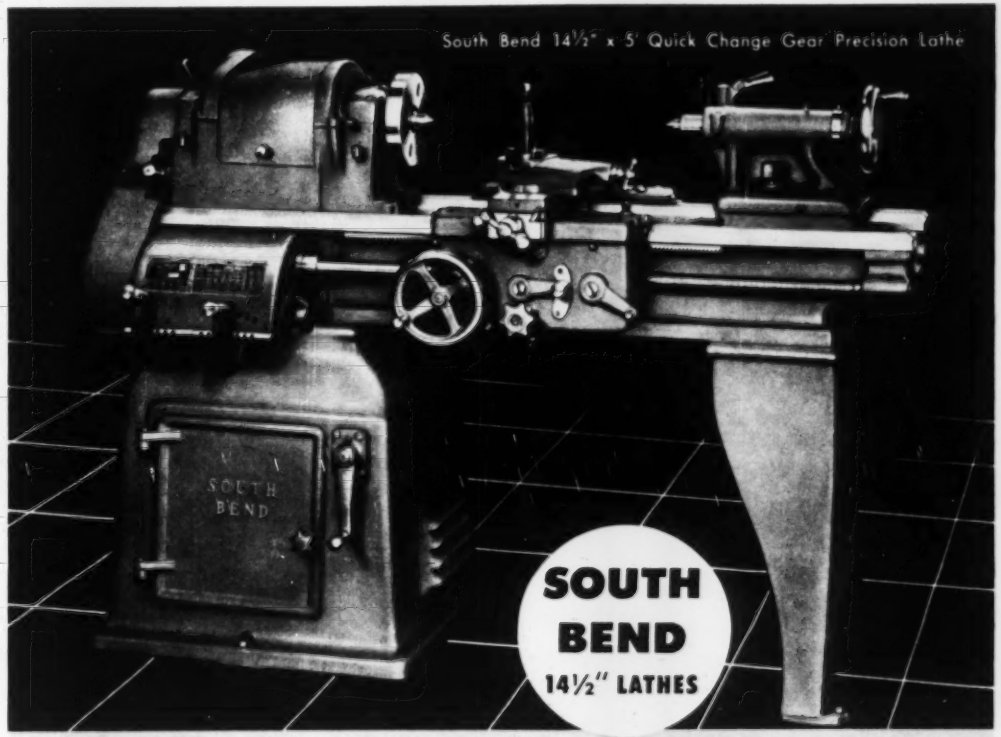
Need for the test stems from a fundamental requirement for temperature stability in electronic equipment, i.e., tuning and other operating characteristics should remain unchanged even when temperature of the equipment fluctuates widely. To avoid temperature-produced changes, compensating elements are used. These are components that change in value as the temperature varies. The problem to be solved was a way to simplify elaborate heating test used previously to adjust these temperature-compensating components properly.

Navy research found the answer in its quick heat pulse check that produces the same effects as were gained before by a long heating run. In addition to reducing time required, this technique has the advantages of less expensive and smaller equipment.

Theory of the technique, description and method of operating equipment and correlation with earlier methods are presented to manufacturers in a 27-page laboratory report. "A New Instrument for Rapid Measurement of Capacitor Coefficients" sells for $1 a copy. Orders should go to Office of Technical Services, U.S. Department of Commerce, Washington 25.

Austin Gives Orton Lecture

James Bliss Austin, director of research, U. S. Steel Corp., will present the Edward Orton Jr. Fellow Lecture at the annual meeting, American Ceramic Society. The lecture, which is a yearly feature of the meeting, is titled "Thermal Expansion of Non-Metallic Crystals." The society's annual session will be Apr. 27-May 1 at the William Penn Hotel in Pittsburgh.



FOR FAST, PRECISION MACHINING

SPECIFICATIONS

SWINGS: 14⅝" over bed and saddle wings; 10¼" over saddle with chip guard removed.

BED LENGTHS: 5, 6, 7 and 8 feet.

DISTANCES BETWEEN CENTERS: 24½ to 60½ inches.

MAXIMUM COLLET CAPACITY: 1 inch. (Collets interchangeable with South Bend 10"-1" Collet, 13", 16" and 16-24" Lathes.)

SPINDLE BORE: 1⅜ inches.

SPINDLE SPEEDS: Eight . . . 27 to 800 r.p.m.

POWER LONGITUDINAL FEEDS: 48 R.H. or L.H., .0015" to .0841".

POWER CROSS FEEDS: 48, .0006" to .0312".

THREAD CUTTING: 48 R.H. or L.H. pitches, 4 to 224 per inch.

CROSS SLIDE TRAVEL: 10 inches.

TAILSTOCK SET-OVER: 1-5/16 inches.

South Bend 14-1/2" Lathes offer many advantages for precision machining. Ease of operation, speed, power, accuracy, and efficiency are some of the features responsible for their popularity. Often the precision and quality of finish obtained with South Bend Lathes are such that subsequent grinding, honing, or lapping operations are unnecessary. Substantial savings in capital investment, power consumption, floor space, and labor costs have resulted from their installation.

SEND INFORMATION CHECKED:

☐ _____

_____

☐ 9" and 10" BENCH LATHES

☐ 10" to 16-24" FLOOR LATHES

☐ ½" and 1" Collet TURRET LATHES

☐ 14" DRILL PRESSES

☐ 7" BENCH SHAPERS

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Building Better Tools Since 1906 • **SOUTH BEND LATHE** • South Bend 22, Indiana

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Grinding Wheels

That 'formula' sure paid off in one grinding department. What does it mean? Simply this: a Simonds Abrasive Company grinding wheel specification C16-S7-B1 boosted production 25%. Why? Because this wheel is accurately specified for the job it had to do. This is true of all Simonds wheel specifications. They're listed in our free data book, along with details on our complete line of grinding wheels, mounted wheels and points, segments and abrasive grain — plus information on how you can get Simonds wheels specially made for out-of-the ordinary jobs. Write for it. Also name of your nearby distributor.

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CALENDAR
OF MEETINGS

April 20-24, National Industrial Service Association: Annual convention, Hotel Conrad Hilton, Chicago. Association address: 818 Olive St., St. Louis 1. Convention publicity: McGiveran-Child Co., 162 N. Clinton St., Chicago 6.

April 21-22, American Coke & Coal Chemicals Institute: Eastern regional meeting, Westchester Country Club, Rye, N. Y. Institute address: 711 14th St., NW, Washington. Executive secretary: Samuel Weiss.

April 21-22, American Zinc Institute Inc.: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: Ernest V. Gent.

April 21-24, Society of Automotive Engineers: National aeronautic and aircraft engineering display, Hotel Statler, New York. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

April 23-25, American Institute of Steel Construction Inc.: Spring engineering conference, Hotel Commodore, New York. Institute address: 101 Park Ave., New York 17. Executive vice president: L. Abbett Post.

April 27-May 1, American Ceramic Society: Annual meeting, William Penn Hotel, Pittsburgh. Society address: 2525 N. High St., Columbus, O. Secretary: Charles S. Pearce.

April 28-29, Association of Iron & Steel Engineers: Spring conference, Netherland Plaza Hotel, Cincinnati. Association address: 1010 Empire Bldg., Pittsburgh 22. Managing director: T. V. Ess.

April 28-30, Chamber of Commerce of the U. S.: Annual meeting, Chamber of Commerce Bldg., 1615 H St. NW, Washington 6. Executive vice president: Arch N. Booth.

April 28-May 3, Concrete Reinforcing Steel Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

April 29-30, Metal Powder Association: Annual meeting and metal powder show, Hotel Drake, Chicago. Association address: 420 Lexington Ave., New York 17. Acting secretary: Robert L. Ziegfeld.

April 30-May 4, Industrial Diamond Association of America Inc.: Annual meeting, Princess Hotel, Bermuda. Association address: 124 E. 40th St., New York. Secretary: Athos D. Leveridge.

May 1-7, American Foundrymen's Society: Annual meeting, Convention Hall, Atlantic City, N. J. Society address: 616 S. Michigan Ave., Chicago. Secretary: W. W. Maloney.

May 1-7, Annual International Foundry Congress & Exposition: Convention Hall, Atlantic City, N. J. Host: American Foundrymen's Society.

May 2-3, Industrial Fasteners Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 3648 Euclid Ave., Cleveland. Secretary: James D. Eggers.

May 4-8, Electrochemical Society Inc.: Semi-annual meeting, Benjamin Franklin Hotel, Philadelphia. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

May 5-6, Stanford Research Institute: National air pollution symposium, Huntington Hotel, Pasadena, Calif. Institute address: 612 S. Flower St., Los Angeles 14. Chairman: Dr. A. M. Zarem.

May 5-7, Automotive Engine Rebuilders Association: Spring meeting, Hotel Plaza, San Antonio, Tex. Association address: 419 N. Capitol Ave., Indianapolis. Executive vice president: R. G. Patterson.

May 5-7, American Mining Congress: Annual spring meeting, Netherland Plaza Hotel, Cincinnati. Congress address: 1102 Ring Bldg., Washington 6. Secretary: Julian D. Conover.

May 6-8, National Highway Users' Conference: Highway transportation congress, Washington. Conference address: National Press Bldg., Washington 4. Director: Arthur C. Butler.

May 6-9, Scientific Apparatus Makers Association of America: Annual meeting, Edgewater-Beach Hotel, Chicago. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

(Continued on p. 121)

Reynolds
ALUMINUM REPORTER

★ ★ ★ Ninth in a Series to Industry on Aluminum Uses and Developments ★ ★ ★

ALUMINUM VITAL IN "BLUE STAR" RACER

Tapered Extrusion Developments Offer Important Design and Production Economies

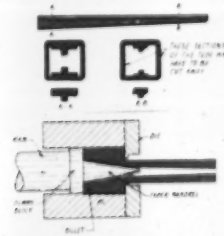
Two Huge Extrusion Presses Being Built for Reynolds Phoenix Plant

Tapered extruding provides the answer to the designing engineer's demand for a shape with a uniformly decreasing area.

By using a tapered mandrel it is possible to extrude a tube with tapered walls. Cutting away the unwanted side walls of this tube then produces the two tapered members as shown in the illustration below.

Thus by use of a tapered mandrel, moved through the die opening wide changes in width, thickness and shape can be obtained throughout the extrusion's length.

Preforming parts by taper extrusion before forging will reduce the number of forging operations required and may eliminate blocking operations entirely.



For further information on new production techniques in extrusion and forging, write for your copy of the Reynolds Technical Advisor, No. 16. We will be happy to add your name to the mailing list for the Reynolds Technical Advisor—a publication devoted to the latest methods for fabricating and processing aluminum and its alloys. Write Reynolds Metals Company, 2576 So. Third St., Louisville 1, Ky.

New Reynolds Extrusion Presses

Two huge extrusion presses of 8,000 and 12,000 tons capacity are being constructed for the Reynolds plant in Phoenix, Arizona.

The 12,000 ton unit will weigh 2,600,000 pounds; the hydraulic system weighing an additional 500,000 pounds. With its runout table it will be more than 250 feet long—almost a full city block. Completion of this gigantic press will take about 22 months.

These new presses will open up countless new design possibilities because they will permit the extrusion of much larger and more intricate parts. This in turn will eliminate joining problems now encountered in making up equivalent assemblies of smaller parts.

Blue Manufacturing Company Uses Reynolds Aluminum Sheet and Extrusions in Speedy New Racing Boat

Picture yourself behind the wheel of the new "Blue Star" Racer shown below. Imagine! Here's a boat that actually has made speeds upward of 40 mph with a 10 hp stock motor.

Here are a few interesting facts told by Max T. Blue, President of the Blue Manufacturing Company, Goddard, Kansas, about this new racer and about the part played by Reynolds Aluminum in its construction.

Aluminum sheet and extrusions are used throughout. As aluminum is much lighter than wood, extra strength without weight is added to the bottom of the boat with longitudinal Tee extrusions for stiffness. This adds strength while still maintaining the 140 pound weight for Class B Stock Utility Racing.

Mr. Blue says, "For high speeds it is very essential to have a smooth and straight bottom or planing surface on your boat. With aluminum, after you once get the boat built you have no warpage to contend with as you do in wood. Also, the smooth finish of aluminum can be highly polished for high speeds; instead of periodical painting you do on wood boats. We also use flush-type rivets throughout on the bottom. This gives a planing surface far superior to any wood boat. Consequently, with the light weight of aluminum we can build a boat that will have many times the strength of wood and yet not weigh any more."

The performance of aluminum in the "Blue Star" Racer has an interesting parallel in likewise superb performance of aluminum as now used extensively in U. S. Navy P. T. Boats.

Marsh Steel Corporation, the Reynolds distributor in North Kansas City, Mo., Denver and Colorado Springs serves the Blue Manufacturing Company with Reynolds Aluminum.

New Reynolds Plants in Texas and Arkansas to Produce 270 Million Pounds of Aluminum Annually

A new Reynolds Metals Company plant is now under construction in San Patricio County, Texas, and will start operation in May of this year. One section, the alumina plant, will process bauxite (aluminum ore) shipped in directly from Jamaica. The other section, the reduction plant, will turn out metallic aluminum at the rate of 160 million pounds annually.

Another new Reynolds plant with an estimated annual production capacity of 110 million pounds of pig aluminum is being planned for erection at Gum Springs, Arkansas.

For a free copy of the 130 page, 6" x 9" Aluminum Structural Design handbook, and a complete index of other Reynolds literature, write on business letterhead (otherwise price is $1.00) to Reynolds Metals Company, 2576 South Third Street, Louisville 1, Kentucky.

MORE INTERESTING NEWS ABOUT ALUMINUM ON NEXT PAGE

(Advertisement)

Printed in U.S.A.

PROCUREMENT PROBLEMS?

check with your Reynolds distributor

Reynolds is putting forth every effort to ease your aluminum-buying problems. To meet the growing demand Reynolds Metals Company and other U. S. producers have already started on another vast expansion program which will greatly increase the country's aluminum production capacity.

To meet your immediate problems the nearby Reynolds distributor listed below is doing his level best to fill orders from limited stocks.

You can also count on his assistance and guidance in selecting temporary alternate materials. He will apply all of his experience and energy to helping you out. Present your procurement problems to him. Now as always he will give you the kind of service you need and want.

YOUR REYNOLDS DISTRIBUTOR IS LISTED BELOW

ALABAMA
Arnold-Brown Metals & Supply Co., Birmingham
Southern States Iron Roofing Co., Birmingham

CALIFORNIA
Clingan & Fortier, Inc., Los Angeles and San Francisco
Richard G. Stern & Co., Los Angeles
Tay-Holbrook, Inc., San Francisco
Union Hardware & Metal Co., Los Angeles
United States Steel Supply Div., Los Angeles and San Francisco
Western Metal Supply Company, San Diego

COLORADO
March Steel Corporation, Colorado Springs and Denver

CONNECTICUT
American Steel & Alloys Corp., Hartford

FLORIDA
Horne-Wilson, Inc., Jacksonville, Miami, Orlando and Tampa
Southern States Iron Roofing Co., Jacksonville, Miami, Orlando and Tampa

GEORGIA
Southern States Iron Roofing Co., Albany, Atlanta, Augusta and Savannah

ILLINOIS
J. G. Braun Co., (Architectural only) Chicago
Silverstein & Finsel Inc., (Ingots only) Chicago
United States Steel Supply Div., Chicago
Benjamin Wolff & Co., Chicago

INDIANA
Hubbell Metals, Inc., Indianapolis

KENTUCKY
Southern States Iron Roofing Co., Louisville

LOUISIANA
Southern States Iron Roofing Co., New Orleans

MARYLAND
Clendenin Bros., Inc., (Wire, rod, bar, structurals) Baltimore
Lyon, Conklin & Co., Inc., Baltimore
United States Steel Supply Div., Baltimore

MASSACHUSETTS
Bay State Refining Co., (Ingots only) Chicopee Falls
Arthur C. Harvey Company, Boston
Pratt & Inman, (Wire, rod, bar, structurals) Worcester

MICHIGAN
Kasle Steel Corporation, Detroit
McDonnell Bros., (Architectural only) Detroit
Milton A. Meier Co., (Ingots only) Detroit

MINNESOTA
United States Steel Supply Div., St. Paul
Vincent Brass & Copper Co., Minneapolis

MISSOURI
Hubbell Metals, Inc., Kansas City and St. Louis
March Steel Corporation, N. Kansas City

NEW JERSEY
Edgcomb Steel Corporation, Hillside

NEW YORK
J. G. Braun Co., (Architectural only) New York
Edgcomb Steel Corporation, Hillside, N. J.
Rochester Smelting & Refining Co., (Ingots only) Rochester

NORTH CAROLINA
Southern States Iron Roofing Co., Raleigh

OHIO
The Atlas Metal Co., (Ingots only) Cleveland
G. A. Avril Smelting Corp. (Ingots only) Cincinnati
The Hamilton Steel Co., Cleveland
Mutual Manufacturing & Supply Co., Cincinnati

OKLAHOMA
Vinson Supply Co., Tulsa

OREGON
Woodbury & Company, Portland

PENNSYLVANIA
Athos Steel Service Co., Philadelphia
Colonial Smelting & Refining Co., (Ingots only) Columbia
Levinson Steel Sales Company, Pittsburgh
Merchant & Evans Co., Philadelphia
Potts-Farrington Company, Philadelphia

SOUTH CAROLINA
Southern States Iron Roofing Co., Columbia

TENNESSEE
Southern States Iron Roofing Co., Nashville and Memphis

TEXAS
Memorial-Lewis Mfg. Co., Dallas, Ft. Worth, Harlingen, Houston, Lubbock, San Antonio, and Temple
Vinson Supply Co., Dallas and Odessa

UTAH
Salt Lake Hardware Co., Salt Lake City

VIRGINIA
Southern States Iron Roofing Co., Richmond

WASHINGTON
Joseph T. Ryerson & Son, Inc., Seattle

WISCONSIN
United States Steel Supply Div., Milwaukee
Benjamin Wolff & Co., Milwaukee

LOOK UNDER "ALUMINUM" IN YOUR CLASSIFIED TELEPHONE DIRECTORY

REYNOLDS METALS

REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

(Concluded from p. 118)

May 7-9, Industrial Waste Conference: Purdue Memorial Union, Purdue University, E. Lafayette, Ind. Secretary: Prof. Don E. Bloodgood, Sanitary Engineering Dept.

May 7-10, National Screw Machine Products Association: Annual spring meeting, Hotel Chase, St. Louis. Association address: 2860 E. 130th St., Cleveland. Executive secretary: Orrin B. Wernts.

May 8-9, The Wire Association: Spring meeting, William Penn Hotel, Pittsburgh. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

May 8-9, National Association of Sheet Metal Distributors: Spring meeting, William Penn Hotel, Pittsburgh. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: Thomas A. Fernley Jr.

May 8-9, American Institute of Mining & Metallurgical Engineers: Northwest metals and minerals conference, Davenport Hotel, Spokane, Washington. Publicity director: W. S. Patterson, Kaiser Aluminum & Chemical Corp., Spokane 10.

May 11-14, American Institute of Chemical Engineers: Annual spring meeting, French Lick Springs Hotel, French Lick, Ind. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

May 11-14, Industrial Furnace Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: V. P. Gopcevic.

May 12-14, Liquefied Petroleum Gas Association Inc.: Annual meeting and exhibit, Palmer House, Chicago. Association address: 11 S. LaSalle St., Chicago 3. Secretary: Arthur C. Kreutzer.

May 14-16, American Leather Belting Association: Spring meeting, Skytop Lodge, Skytop, Pa. Association address: 320 Broadway, New York 7. Secretary: E. R. Rath.

May 14-16, Society for Experimental Stress Analysis: Spring meeting, Hotel Lincoln, Indianapolis. Society address: Box 168, Cambridge, Mass.

May 18-21, Copper & Brass Research Association: Annual meeting and exhibit, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: Bertram B. Caddle.

May 19, Rail Steel Bar Association: Annual meeting, General Brock Hotel, Niagara Falls, Ont. Association address: 38 S. Dearborn St., Chicago 3. Secretary: W. H. Jacobs.

May 19-20, American Steel Warehouse Association Inc.: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: 442 Terminal Tower, Cleveland 13. President: Walter S. Doxsey.

May 19-21, National Industrial Distributors Association: Annual meeting, Atlantic City, N. J. Association address: 1900 Arch St., Philadelphia 3. Secretary: H. R. Rinehard.

May 19-21, American Supply & Machinery Manufacturers Association: Annual convention and conference booth activity, Hotel Traymore, Atlantic City, N. J. Association address: 731-732 DuPont Circle Bldg., Washington. General manager: R. Kennedy Hansen.

May 20-21, Nuclear Energy Conference: Michigan State College, E. Lansing, Mich. Program chairman: D. J. Renwick, Mechanical Engineering Dept.

May 21-22, American Iron & Steel Institute: Annual meeting, Waldorf - Astoria Hotel, New York. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

May 21-23, Gas Appliance Manufacturers Association: Spring meeting, The Broadmoor, Colorado Springs, Colo. Association address: 60 E. 42nd St., New York. Secretary: H. Leigh Whitelaw.

May 22-24, American Society for Quality Control: Annual meeting & exhibit, War Memorial Auditorium, Syracuse, N. Y. Society address: 70 E. 45th St., New York 17. Secretary: Alfred L. Davis.

May 25-28, National Association of Purchasing Agents: Annual international convention & exposition, Convention Hall, Atlantic City, N. J. Association address: 11 Park Place, New York 7. Executive secretary: George Renard.

WHAT'S THE FASTEST WAY TO CLEAN METAL?
See page 11
WHAT'S THE MOST ECONOMICAL WAY?
See page 9
Some good things to know about Metal Cleaning

Oakite's FREE booklet on Metal Cleaning

answers many questions that mean better production, more profit for you. Just look at the table of contents:

Tank cleaning methods
Machine cleaning methods
Electrocleaning steel
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Pickling, deoxidizing, bright dipping
Pre-paint treatment in machines
Pre-paint treatment in tanks and by hand
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Steam-detergent cleaning
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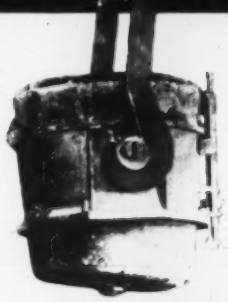
Vibrationless LIFTING POWER



300/60/20-TON, 4-GIRDER DOUBLE TROLLEY *Alliance* LADLE CRANE

● Building big cranes has been our business here at Alliance for more than 50 years. Whenever the industrial world has required cranes of large capacity, it has always found The Alliance Machine Company with designs and "know-how" to meet its requirements.

The 4-girder, double trolley ladle crane illustrated here was built for the Homestead Steel Works of the United States Steel Company to handle the increased Open Hearth capacity. It required a 4-story cage to house the electrical equipment to control the various motions of this crane. The three upper stories contain the magnetic control equipment and resistors. The bottom section of the cage houses the master controllers and the operator and is insulated.

This ladle crane is equipped with a two-motor, synchronized worm drive, interlocked double drum type main hoist. The synchronizing shaft employed in this scheme of gearing not only eliminates the undesirable ratchet gears but makes possible an additional safety feature in case one of the hoist motors fail. Under this condition both worms are driven by the remaining motor and all gearing functions as with two motors. In case of failure of one hoist motor on the conventional drive **without** the synchronizing shaft, hoisting is accomplished by **only one** set of gears. This imposes a double load on active gearing, the second drum being driven through the interlocking drum gears. The hoist gearing is so proportioned that the full capacity of the crane can be lifted by one motor without exceeding the quarter-hour rating.

The drum gears and pinions of the main hoist of this new crane have precision-cut, single-helical teeth, and in cooperation with the worm drive, assure vibrationless operation on either high or low speed hoisting and lowering.

All gears are fully enclosed and operate in a bath of oil, assuring long life and low maintenance.

The 4-part safety rope system installed on this crane affords the highest degree of safety in rope reeving.

Why not consult The Alliance Machine Company engineers when you have heavy material handling problems?

THE ALLIANCE MACHINE COMPANY

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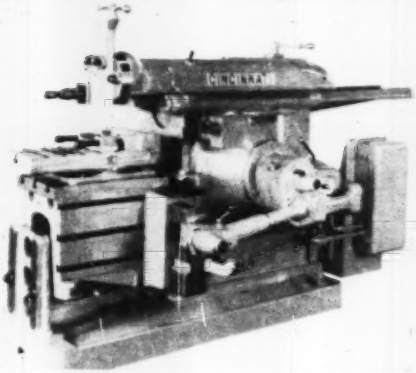
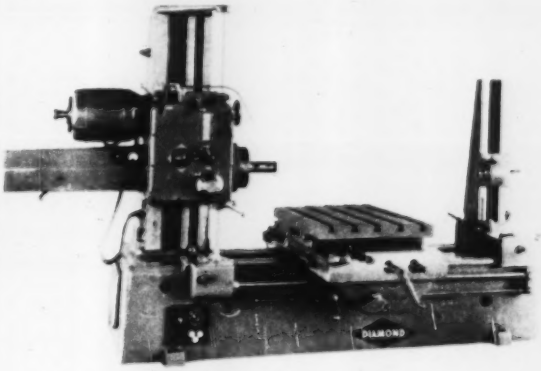
LADLE CRANES • GANTRY CRANES • FORGING MANIPULATORS • SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET CHARGING MACHINES • OPEN HEARTH CHARGING MACHINES • SPECIAL MILL MACHINERY • STRUCTURAL FABRICATION

New Products and Equipment



FINGERTIP CONTROL OF BRAKE-CLUTCH OPERATION
. . . positions ram quickly, accurately for setting tools



DESIGN PROVIDES INFINITE CONTROL OF FEEDS ON FACING HEAD
. . . machine has 18 feeds with rapid traverse available in all directions

Shaper Uses Magnetic Clutch

USE REPLY CARD—CIRCLE No. 1

Cincinnati Shaper Co., Hopple & Garrard Sts., Cincinnati 25, O., offers shapers equipped with electromagnetic clutch and brake. Application is made to insure instant starting and stopping with single finger-tip control lever. Ram can be positioned quickly and accurately for setting tools by the instant action of clutch and brake. Time savings reaching 30 per cent are attributed to the electromagnetic unit on some jobs. No adjustment of clutch or brake is required for the life of friction surfaces—estimated at about 15 years of normal operation. Torque remains constant throughout operating life. Redesigned clutch and brake are standard on all sizes of shapers made by the company.

Power Frequency Amplifier

USE REPLY CARD—CIRCLE No. 2

Power frequency amplifier made by Keithley Instruments, 3868 Carnegie Ave., Cleveland 15, O., is designed to reduce errors caused by measuring instruments that load a test circuit. Called model 105 Meter Matcher, its use relieves a test circuit from supplying usual power to measuring voltmeter or wattmeter. Input is connected to a test circuit; output to a voltmeter or voltage coil of a wattmeter. Unit's input impedance requires maximum 150 microamperes from circuit being tested. Its output provides 0.05 to 0.07 amp. Input connections for 15, 75, 150, 300 and 600-v are provided. In each case output is 150 v.

Chrome Plating Line Expanded

USE REPLY CARD—CIRCLE No. 3

Addition of the model A-250 Chromaster to its line of industrial chrome plating equipment is announced by Ward Leonard Electric Co., Mt. Vernon, N. Y. The tool is designed for plating small tools or parts in large quantities, or for processing large parts having areas to 125 sq in. Individual floor-mounted plating tank and power unit are designed to minimize installation costs and to conserve floor space.

Power unit contains a built-in selenium rectifier, complete with instrument panel and controls for regulating rate of chrome deposit accurately. Average plating time is $3\frac{1}{2}$ minutes for cutting tools.

REPLY CARDS

on page 137 will bring you more information on any new products and equipment in this section.

Horizontal Boring Mill

USE REPLY CARD—CIRCLE No. 4

Features of larger mills are claimed for a 3-inch horizontal boring mill announced by Diamond Machine Tool Co., 3429 E. Olympic Blvd., Los Angeles 23, Calif. Important points reported include infinite control of feeds on facing head; 10-hp motor with amperage load regulator; and 18 feeds with rapid traverse in all directions. Other specifications include a 3-inch spindle diameter, No. 5 Morse taper and $32\frac{1}{4}$-inch maximum spindle run.

Maximum distance from platform to counter support is 70 inches. Turnable is $34\frac{1}{4}$ x $25\frac{1}{4}$ inches; longitudinal run of table is $45\frac{1}{4}$ to $57\frac{7}{8}$ inches; and transversal run, 24 inches.

Weight Balance Milling Machine

USE REPLY CARD—CIRCLE No. 5

Weight-balancing machine designed by Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 15, O., in co-operation with Toledo Scale Co., Toledo, O., mills automotive connecting rods. Machine removes sufficient metal from each end of the connecting rod to keep the rod's balance within two grams. Reciprocating table rotates 180 degrees, carrying two sets of workholding fixtures. Fixtures are two opposed quill-type milling heads, mounted on hard-

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ened ways and a Toledo Scale unit housed in a floor-mounted cabinet. The latter is positioned at right angles to the machine.

To start the cycle, operator places an overweight rod on the scale unit where each end is weighed individually about the fixed center of gravity. Amount of overweight is transmitted electrically to the machining unit. Heavy duty milling heads can use carbide or high-speed cutters, operating on a maximum 10 hp. Production rate is 320 pieces per hour, but machine's cycle is arranged to accommodate a higher rate.

Machine Works Drilled Brass

USE REPLY CARD—CIRCLE No. 6

Small holes in brass disks are reamed and tapped simultaneously on a machine made by Govro-Nelson Co., 1933 Antoinette, Detroit 8, Mich. Disks are first run through the company's drilling machine where two holes are drilled and

. . . reams, taps disks simultaneously

a third drilled and counterbored with a combination tool for the tap. Part is then worked on the machine illustrated which incorporates two automatic drilling units to ream the previously drilled holes and one tapping unit to tap the No. 00-96 hole. Holes reamed are 0.0709-inch. Machine produces at a rate of 10 pieces per minute.

Dual Brushes Control Dust

USE REPLY CARD—CIRCLE No. 7

Sweeper with dual brushes arranged in tandem and featuring vacuum dust control is announced by Moto-Mower Co., 4600 Woodward Ave., Detroit 1, Mich. Brushes operate in opposite directions, front brush moving clockwise to

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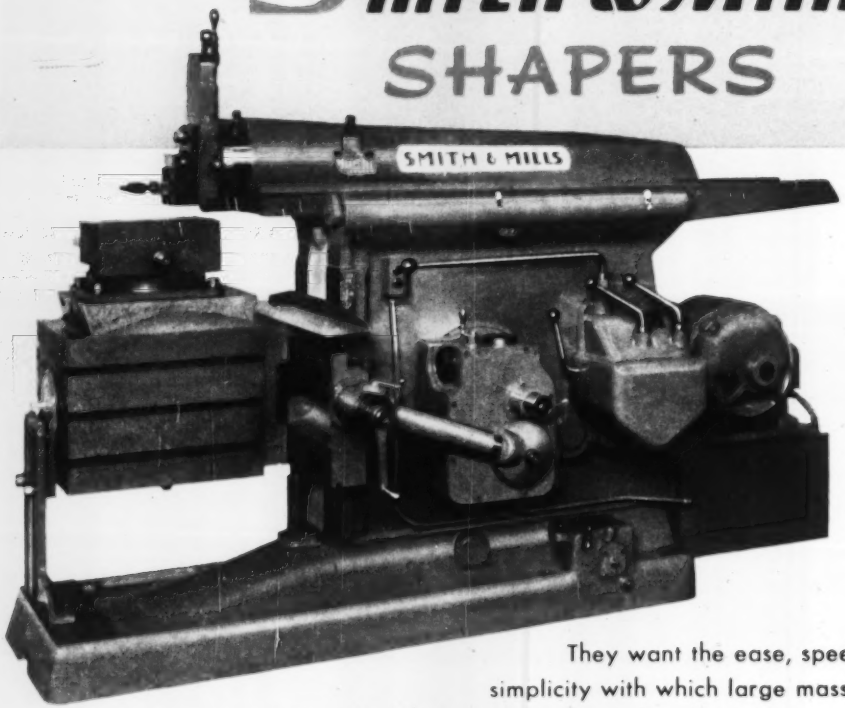

They want the ease, speed and simplicity with which large masses are removed with smooth finish — and such operating features as solid ram — ram position adjustment — simple speed selection — quickly handled feed mechanism — fast, easy stroke setting — power rapid traverse — and the combination of brute strength and sensitivity.

Management, too, wants Smith & Mills' low maintenance costs and minimum down time for heavy metal cutting production jobs and their extreme precision tool room work.

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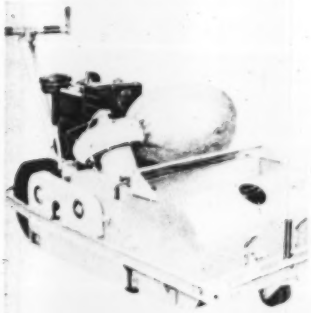
Fine Shapers since 1888

throw heavier debris upward into the path of the rear brush. The latter operates counter-clockwise, depositing material in the hopper and throwing nothing forward or underneath. Dust is drawn upward and pocketed by unit's vacuum system, eliminating dust discomfort in the cleaning area. Heavy-duty fiber bristle brushes are sufficiently strong to pick up most refuse.



. . . cleans 35,000-40,000 sq ft per hour

Power steering provides ample maneuverability. This is accomplished by using separate clutch on each wheel, operated by levers on the handle bar. Sweeper is 34¼ inches wide. Its capacity permits cleaning 35,000 to 40,000 sq ft per hour. Optional equipment includes sulky with footbrake and an 11-inch side brush for cleaning along walls.

Cab Conditioning Line Expands

USE REPLY CARD—CIRCLE No. 8

Model C-3SP is added to the line of crane cab air conditioning and ventilating equipment made by Dravo Corp., Neville Island, Pittsburgh 25, Pa. A split-type, 3-hp cab cooler, the model is designed to maintain a temperature of 80-85 F within cabs when surrounding ambient temperatures reach 130 F. The unit supplies continuous ventilation, is equipped with electric strip heaters for winter heating and has dust and dirt filters as well as activated carbon canisters for fume and odor removal.

Operation and control for summer and winter temperatures is fully automatic. Small, compact evaporator section can be installed in the cab and condenser section can be located in any convenient place on the crane. The two sections are connected by refrigerant piping.

Heavy-Duty Crawler Crane

USE REPLY CARD—CIRCLE No. 9

American Hoist and Derrick Co., St. Paul 1, Minn., offers its ¾-yard crawler crane, available with a choice of fronts: Crane, shovel, dragline or pull shovel. Machinery platform of the model 375-BC is an integral-rolled steel electrically-welded unit, used instead of the conventional cast center with bolted-on walkways. It falls in the heavy-duty 45,000-pound class.

Track pads are double-walled, special steel castings with full-length pins. High speed boom hoist with controlled lowering arrangement is standard equipment. Radius can be changed with complete control and with no danger of dropping the boom. Lightweight

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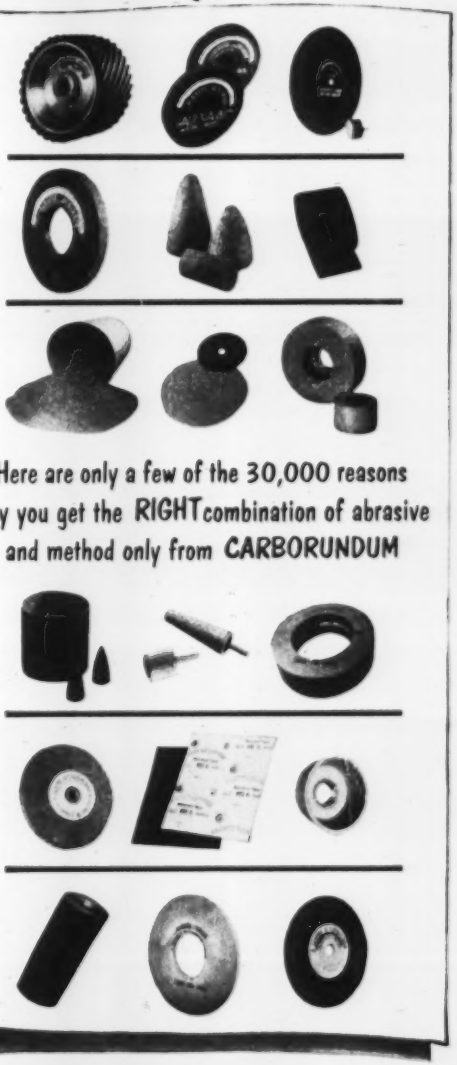

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40% of the *biggest* fires in a single year showed lack of fire-door protection as contributing to the heavy losses.*

You get *positive, automatic, dependable* fire protection at doorways and windows with *Akbar* Fire Doors. They're *pushed* downward by a strong spring . . . *controlled* in downward speed . . . and operable *after* closure, for emergency use.

These efficient doors remain coiled out of the way, overhead, when not in use, but lower *automatically*, with speed, efficiency and *safety*, when fire threatens. They combat fire loss by cutting off drafts, blocking flames, and confining fire to small areas.

Approved and labeled by Underwriters' Laboratories, they have saved as much as 55% of their cost *annually*, in reduced insurance rates. Built to fit windows, doorways or other openings of any size.

"Akbar" Doors can also be equipped for daily service use, with or without motor operation. But standard (non-labeled) Kinnear Rolling Doors are preferred for service use where extra fire protection is not needed.

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*(As reported in the Jan. 1947 Quarterly of the National Fire Protection Association.)

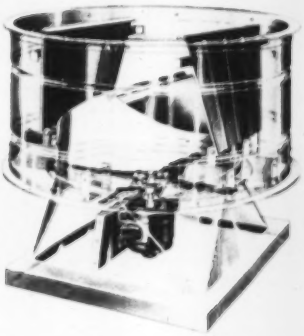
SAVING WAYS IN DOORWAYS **KINNEAR** ROLLING DOORS

alloy steel used in the boom eliminates dead weight and permits maximum pay loads. Ball joint rod end bearings are used in the hoist, swing and travel linkage system; antifriction bearings are used in the brake linkage system. Shovel has an electric, pushbutton operated, dipper trip.

Free Exhaust Fan Ventilator

USE REPLY CARD—CIRCLE No. 10

Industrial ventilator made by Burt Mfg. Co., Dept. S, 927 High St., Akron 11, O., clears air contaminated with smoke, fumes, dust and heat from specific areas. Ventilator is powered in rapid purifying



. . . clears impure air from specific areas

action by the company's axial flow fan, connected directly to the motor. Air shaft extends above the fan, terminating in a pair of dampers that open and close automatically as the fan is turned on and off. Free damper opening allows unrestricted air volume to be driven vertically upward at high velocity.

Seven sizes, with motors from $\frac{1}{3}$ to 5-hp, provide capacities from 5000 to 75,550 cfm. Galvanized sheet is used in standard construction; use of other metals can be specified.

Drill Press Line Improved

USE REPLY CARD—CIRCLE No. 11

Redesigned line of 15-inch drill presses is announced by Walker-Turner Division, Kearney & Trecker Corp., Plainfield, N. J. Front line has $\frac{1}{2}$-inch capacity in cast iron and drills to the center of a 15-inch circle. Spindle travel is $4\frac{1}{2}$ or 6 inches. Latter model incorporates a calibrated depth gage

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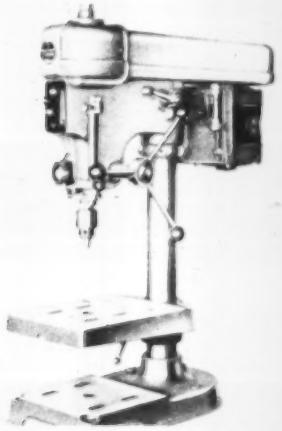
and a micrometer-type depth stop. All models feature a completely enclosed motor switch housing built into the head casting. Belt guards are made of lightweight steel stampings and are standard equipment.

Four standard speeds range from 600 to 5000 rpm, but a slow speed



. . . incorporates a calibrated depth gage

pulley can be supplied where reduced speeds are required. Six-spline spindle, independently mounted spindle pulley and one-piece head castings are retained. Machines are available in bench, floor and multi-spindle types.

Oil Hydraulic Motor-Pump

USE REPLY CARD—CIRCLE No. 12

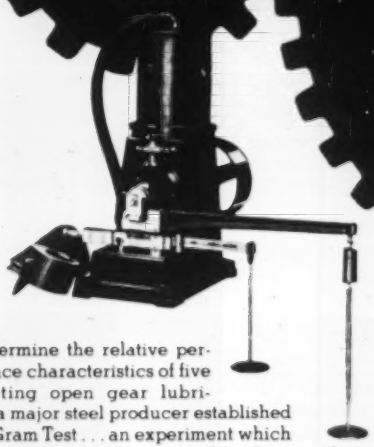
Vane-type oil hydraulic pump, also applicable as a fluid motor, is offered by Denison Engineering Co., Columbus, O. The single stage unit can be used in its two-way performance without alterations. In addition to dual-purpose qualities, it permits either clockwise or counter-clockwise rotation for both pump and motor operation. Direction of rotation can be reversed by means of a simple change in position of the pumping cartridge.

Four sizes are available, each offered with a choice of cam rings to widen range of oil delivery or torque ratings. In pump applications, these capacities range from $2\frac{1}{2}$ to 60 gpm; in fluid motor use, they range from 12 to 257 inch-pounds of torque per 100 psi. Vanes on the 2000-psi motor-pump

INDEPENDENTLY CONDUCTED

4-GRAM TEST

—PROVES Klingfast BEST



To determine the relative performance characteristics of five competing open gear lubricants, a major steel producer established the 4-Gram Test . . . an experiment which reproduces as closely as possible the actual service conditions encountered in open gear and sleeve bearing lubrication.

In this test the Timken Testing Machine, recognized as standard equipment for testing lubricants, was modified slightly to reproduce more precisely actual service conditions. The hardened and ground steel block and cup, indicated at right, normally is under constant lubrication. However, in the 4-Gram Test the flow of lubrication was cut off and 4 grams of the lubricant being tested were applied at room temperature. The machine then was set in motion and watched closely for signs of scoring.

Five lubricants, all accepted in industry as "good quality," were tested. *Results of the test showed that LEADOLENE KLINGFAST gave over 3½ times the service of the next best lubricant and up to 6 times the service of the other lubricants tested.*

Since open gears are lubricated periodically and not constantly, the pH-ilm must have lasting characteristics. Thus, this test is truly representative of actual field operation tests for open gears. The enduring action together with extremely high pH-ilm strength guarantee the machine actual lubrication and protection.

In testing . . . and more important, in actual service . . . LEADOLENE KLINGFAST regularly gives comparable performances. A product of 76 years of manufacturing experience, it is a lead-based lubricant with an "Indestructible pH-ilm," capable of withstanding pressures up to 50,000 psi. With LEADOLENE KLINGFAST you profit in two ways: from lowered lubrication costs due to less frequent application, and from greater service life from the machinery being lubricated.

Write for technical data or samples for your own testing.

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Results OF 4-GRAM TEST

LEADOLENE KLINGFAST 30 MINUTES without scoring or failing.

LUBRICANT "A" 5 MINUTES A high grade compound scored at 5 minutes and failed in 12 minutes.

LUBRICANT "B" 8 MINUTES A reputable lubricant of residual nature scored and failed in 8 minutes.

LUBRICANT "C" 6 MINUTES A good lead compounded extreme pressure lubricant scored and failed in 6 minutes.

LUBRICANT "D" 6 MINUTES A lead-compounded lubricant scored and failed in 6 minutes.

feature dual sealing edges to assure good valving action at point of exhaust. Porting blocks can be used interchangeably as suction or pressure ports for pump needs, or as inlet and outlet ports in motor applications.

Spray Gun Mover Cuts Waste

USE REPLY CARD—CIRCLE No. 13

Compressed air operated spray gun mover for applying liquid compositions is a development of Clair Mfg. Co., Olean, N. Y., and Lea Mfg. Co., Waterbury 20, Conn., and is marketed by the latter. Unit is offered to correct a problem caused when equipment continues to spray during directional halts, deceleration and acceleration. In operation, the gun mover automatically completes one pass each time the operator trips its foot pedal microswitch. Largest size of equipment covers 2 to 40 inches with one gun moving at uniform speed over straight line traverse. All moving parts are totally enclosed.

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Special machinery is created in our shops from your own design . . . or we will design and fabricate to solve your specific problem.

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and
YORK ENGINEERING & CONSTRUCTION CO.
931 Penn Avenue, Pittsburgh 22, Pa.

Lightweight Soldering Iron

USE REPLY CARD—CIRCLE No. 14

A standard-voltage, lightweight, soldering iron designed for pinpoint, high speed soldering in close quarters is announced by Industrial Heating Department, General Electric Co., Schenectady, N. Y. Iron is heated by a Calrod heater that protrudes into the tip, thus giving efficient heat transfer.

Carbide Tipped Drill Bit

USE REPLY CARD—CIRCLE No. 15

Designed for drilling holes $^3/_4$ to 5 inches in diameter in hard masonry, Thunder Core carbide tipped drill bits are available from New England Carbide Tool Co., Cambridge 39, Mass. It makes it possible for one man to quickly drill holes in hard masonry with no binding.

Ratchet Lowering Lever Jack

USE REPLY CARD—CIRCLE No. 16

A lightweight ratchet lowering lever jack with an aluminum housing is announced by Templeton, Kenly & Co., Chicago, Ill. Known as Simplex A1022, it has a 10-ton capacity and weighs 42 pounds.

Self-Energizing Clutch

USE REPLY CARD—CIRCLE No. 17

An automatic centrifugal clutch, offered by Elgin Sweeper Co., Elgin, Ill., is designed to provide maximum efficiency of any gasoline engine or electric motors wherever load starting requires a large initial torque. Clutch automatically disengages when engine or motor speed is reduced for idling.

Holds Light Work

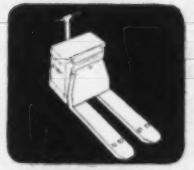
USE REPLY CARD—CIRCLE No. 18

Wilton Tool Mfg. Co., Chicago 14, Ill., offers a cam acting vice that holds light work and permits operator to postion work easily. The vise is mounted on the company's junior Powrarm which permits assembly operator to position work without holding it.

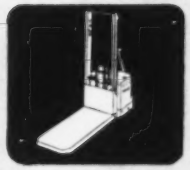
Cleans Small Straight Tubes

USE REPLY CARD—CIRCLE No. 19

Lagonda Division, Elliott Co., Jeannette, Pa., has developed a line of suspension-type condenser cleaners designed for cleaning



Pallet Worksaver



High-Lift Platform Worksaver

Platform Worksaver

High-Lift Fork Worksaver

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YALE *WORKSAVERS*

Tractor Worksaver

USE *WORKSAVERS*

in moves involving freight elevators. YALE WORKSAVERS may be carried safely on the elevator with the load, eliminate reloading and relifting.

USE *WORKSAVERS*

on low-load floors. Mechanize areas out-of-bounds to heavier trucks with speedy, dependable, low-cost YALE WORKSAVERS.

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in tight storage areas. They're easy to manage in narrow aisles; save time, cost and effort in moving and storage operations.

YALE WORKSAVER Electric Trucks lift, stack and carry loads up to 6,000 lbs., and may be used in many areas where weight or space rule out big-truck use. Low in initial cost, economical in operation, and simple for anyone to use—their performance meets the quality standards that industry identifies with YALE Industrial Trucks of every kind.

CALL YOUR YALE REPRESENTATIVE FOR A FREE WORKSAVER DEMONSTRATION

Get an eye-opening demonstration of rugged WORKSAVER performance. Be sure to ask about the famous WORKSAVER *Power Team*—Truck, Battery, Battery Charger. There's no obligation, of course.

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YALE & TOWNE

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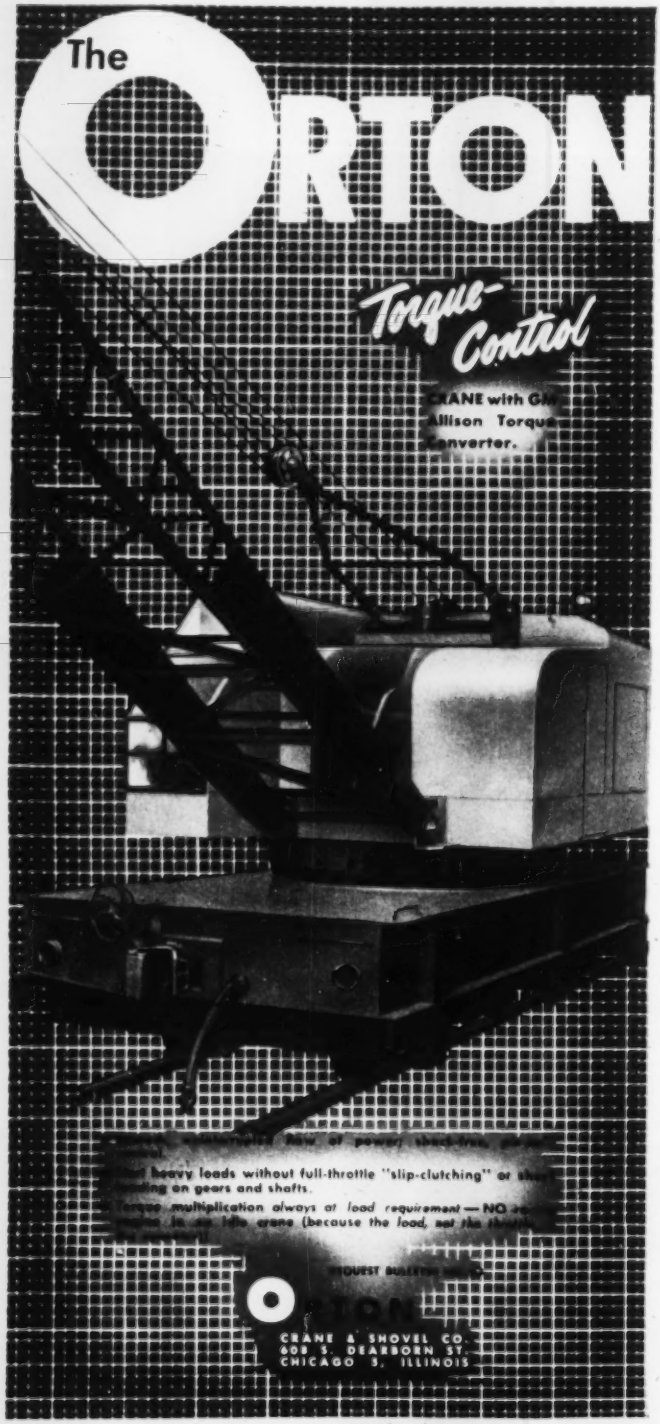
YALE GAS AND ELECTRIC TRUCKS • YALE HAND TRUCKS • YALE HAND AND ELECTRIC HOISTS



small, straight tubes. In operation they are supported from overhead by a trolley, rope-block or hanger. Control valve is actuated by a squeeze trigger located at base of one of the operating handles.

Electronic Welder Control

USE REPLY CARD—CIRCLE No. 20

Square D Co., Milwaukee 12, Wis., announces a simplified design of its electronic nonsynchronous resistance welder control. Its simplification provides easier installation, less maintenance, smaller size and greater mounting versatility. Extreme consistency and timing accuracy are maintained.

Pulley Lagging Compound

USE REPLY CARD—CIRCLE No. 21

Pulley surfaces can be quickly lagged in place by brush or spray with neoprene Pullag, available from Main Products Corp., Philadelphia 47, Pa. Compound gains strength over a period of time and reaches its maximum in eight days. It may also be heat cured in 6 hours at 150° F.

Respirator Hood

USE REPLY CARD—CIRCLE No. 22

A flyweight respirator hood designed for dust and paint spray protection and made with a replaceable plastic window is introduced by American Optical Co., Southbridge, Mass. It is available with company's R2000 seven interchangeable cartridge and disk filter respirator.

Twist Drills

USE REPLY CARD—CIRCLE No. 23

Butterfield Division, Union Twist Drill Co., Derby Line, Vt., announces a line of high speed and carbon twist drills. Besides standard styles and types of twist drills, line will include drills styled for materials such as magnesium,

USE A
REPLY CARD
Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

70. Fasteners

Standard Pressed Steel Co.—12-page illustrated bulletin 675-2 "Standards" shows all standard sizes available in the entire Unbrako line, including socket heat cap screws, self-locking set screws, socket set screws (standard points), shoulder screws, flat head socket cap screws, Dryseal-thread pressure plugs, square head setscrews, dowel pins and hexagon socket screw keys. Specs of all are given.

71. Fork Lift Truck

Tracto Lift Co.—The "Paul Bunyan" of fork lift trucks—that's what 8-page brochure calls the Tracto all purpose fork lift truck designed for heavy duty industrial use. Bulletin pictures many possible applications and gives full specifications.

72. Indexing Table

Turner Bros., Inc.—Adaptable for milling, drilling, reaming, boring, crimping, stamping and assembling, the Hautau-Turndex automatic indexing table is available in from 2 to 36 stations, in any equal division of 360 degrees. Read about this unusual table described in 8-page form TG-100 which also gives dimensional drawings, illustrations and specifications on two available models.

73. Bench Shaper

South Bend Lathe Works—"Jobs You Can Do" is title of illustrated brochure on the South Bend 7-in. precision bench shaper. Description of machine, accessories that increase its versatility, features and specifications are given, along with a list of distributors located from coast to coast.

74. Spring Data

Accurate Spring Mfg. Co.—"Handbook of Technical Data on Springs" is just what its name implies. In this well-illustrated 44-page booklet you will find answers to problems involving spring design; helical, compression, tension and torsion spring design formulations; load deflection tables; conversion formulas for types of spring ends, specification guidance and other worthwhile information. There's a copy for you!

75. Welding Facilities

20-page brochure entitled "This Is the American Welding and Manufacturing Company" describes and illustrates company's management, research, engineering and production facilities as well as many of the varied products turned out.

76. Broaching Machines

American Broach & Machine Co.—Complete specifications are tabulated on line of 15, 20 and 30-ton horizontal broaching machines in circular 501. Machines carry electrical and hydraulic circuits conforming to JIC standards and provide for increased broaching and return speeds.

77. Production Machinery

Williams-White & Co.—Presses, benders, bulldozers, punches, shears, rolls and hammers are typical of the machines which are briefly described in 8-page illustrated bulletin entitled "Production Machinery." Sizes and types for every need are shown.

78. Perforated Metals

Accurate Perforating Co.—24-page illustrated catalog No. 6 presents ordering information, specifications and reproductions of perforated metal screens available in variety of sizes and shapes for industrial and ornamental uses. Specs include hole sizes, centers, pattern and amount of open area.

79. Custom-Built Motors

B. A. Wesche Electric Co.—8-page illustrated bulletin "Welco Custom-Built Torque Motors and Collector Rings" gives performance features and applications of equipment which has been built to user's specifications.

STEEL 4-21-52
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80. Gasoline Fork Trucks

Yale & Towne Mfg. Co.—The industrial truck that handles like a car is theme of 12-page illustrated bulletin 5101 on Yale gasoline fork trucks. These versatile materials handling machines are offered with capacities from 1000 to 10,000 lb. Also covered are attachments which increase the utility of these units.

81. Sling Chains

American Chain & Cable Co.—Full description, illustration and specifications pertinent to different types of sling chains can be found in catalog DH-314. Information is also given on Registered sling chain with foundry hooks and Ox-Bow magnet chains.

82. Stainless Clad Steel

Alan Wood Steel Co.—Applications and physical properties of Permaclad stainless clad flat rolled steel are covered in 8-page illustrated folder. Welding information, chemical compositions, finish information, forming data and special grades offered are detailed.

83. Stamping and Washers

Whitehead Stamping Co.—Blanked formed and drawn; assembling and finishing; and light, medium or heavy stampings available from company are shown in 20-page illustrated catalog No. 1540-9149. Also included are specs for various clips, washers, bushings, plugs, and washer dies available, plus card or label holders and line of automotive type mirrors.

84. Metal-Enclosed Switchgear

Westinghouse Electric Corp.—30-page illustrated booklet B-5282 deals with line of Unitized low-voltage metal-enclosed switchgear for indoor and outdoor installation. Current ratings, interrupting ratings and other data are included on De-Ion air circuit breakers. Standard switchgear assemblies, universal frames, bus supports, current transformers and breaker attachments are covered also.

85. Protective Sleeves

A & A Mfg. Co.—There's a size and type of Gortite-Sleeve protection for practically any moving part such as piston rod, machine way, lead screw, universal joint or gun slide. Typical telescopic sleeves and covers are shown in 4-page illustrated bulletin AH-2.

86. Induction Furnaces

Ajax Electrothermic Corp. — 16-page illustrated bulletin 14-A will give you advantages, operating principles, melting performance and specifications for converter type 20 and 40-kw Ajax-Northrup high frequency furnaces. Models for ferrous and nonferrous melting and heating applications are covered.

EDITORIAL REPRINTS:

87. Steel Hardenability

STEEL reprint entitled "Closer Hardenability Control for Silicon-Chromium Steel" is report of investigation held at Timken Roller Bearing Co. Major finding as reported by B. C. Schott and S. Isenberg, company metallurgists, is that in silicon-chromium valve steel, hardenability decreases as silicon content increases from 2.35 to 4.92. Get this reprint and read the details of this experiment.

88. New Finishing Techniques

"Shaping, Finishing Horizons Widen" is title of STEEL reprint which points to the new electromechanical, electrochemical and ultrasonic machining techniques as offering promise for shaping and finishing hard-to-work materials in addition to conserving supplies of diamond bort. Report discusses four processes and combinations that are available.

89. Plug-In Induction Heating

Plug-in 60-cycle induction heating which has grown so popular in nonferrous industries has promising future in steel processing as well, according to B. E. McArthur, Magnethermic Corp. Popularity, says author in STEEL reprint, is due to compactness, higher frequency induction heating without motor-generator and low initial and maintenance cost.

90. Porcelain Coated Steels

Porcelain enamel may be important solution to critical metal supply problems. STEEL reprint "Possibilities in Porcelain Enamel-Coated Steels Conserve Scarce Alloys" reports that coatings have high resistance to temperature, corrosion, thermal shock severe abrasion and a low coefficient of friction. Possible copper, brass and bronze applications are discussed.

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6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
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aluminum, plastics, etc., as well as various types for operations such as aircraft extension, heavy duty and automotive series drills.

Two Control Valves

USE REPLY CARD—CIRCLE No. 24

Models 1570 and 1580 control valves are announced by Annin Co., Los Angeles 23, Calif., for handling a wide variety of materials at extremes of temperature and pressure. A design feature of the single seated valves is the external self-balancing arrangement that provides a balance valve effect in operation.

Built-In Extinguishing System

USE REPLY CARD—CIRCLE No. 25

Packaged automatic carbon dioxide systems are available from Walter Kidde & Co. Inc., New York, N. Y., for installation by the customer. Designed to protect normal industrial types of flammable liquid hazards of up to 6000 cu ft, system may be adapted for protection against some special hazards.

Packaged Rust Preventive

USE REPLY CARD—CIRCLE No. 26

Metal Guard, a rust preventive and lubricating oil spray packaged in a 12-ounce aerosol spray container is announced by Mitchell Chemical Co. Inc., Stratford, Conn. It is an all-purpose oil and has water-displacing characteristics that allow it to get under any water or wetness on the metal surface prior to spraying.

High Heat Refractory Line

USE REPLY CARD—CIRCLE No. 27

Hy-Temp Refracto line of National Foundry Sand Co., Detroit, Mich., consists of bricks in all shapes, bonding cements, linings and bottom materials for electric furnaces. While not dissimilar in basic composition, products are varied in formulation.

USE A
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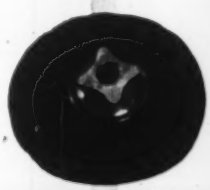
Just circle the corresponding number of any item in this section for more information.

RUBBER
bonded to
METAL*



*NEW "ANDAL"
PROCESS BONDS RUBBER
TO METAL OR CERAMICS

Rubber-metal fabrications for application in electrical control devices, conveyors, switches, contacts, controllers, control valves and a wide range of processing equipment now can be supplied in a variety of sizes and shapes.

Intricate as well as *simplified parts* can be fabricated using almost any shape or cross section of metal or ceramic material. Both *ferrous* and *non-ferrous metals* can be fabricated into the rubber parts.

Rubber compounds available for use in the metal-rubber fabrications include natural or reclaimed stocks as well as from Buna S, Buna N, Neoprene, Butyl, Thickol and other synthetics.

Rubber-bonded-to-metal parts can be furnished which will remain stable upon exposure to temperatures ranging from -75 to 200 degrees F. Special stocks featuring resistance to abrasion, weathering and various chemicals can be utilized in parts.

Write today and tell us your problem!

618 AA-R

ANDREWS-ALDERFER COMPANY
1127 HOME AVENUE • AKRON 10, OHIO

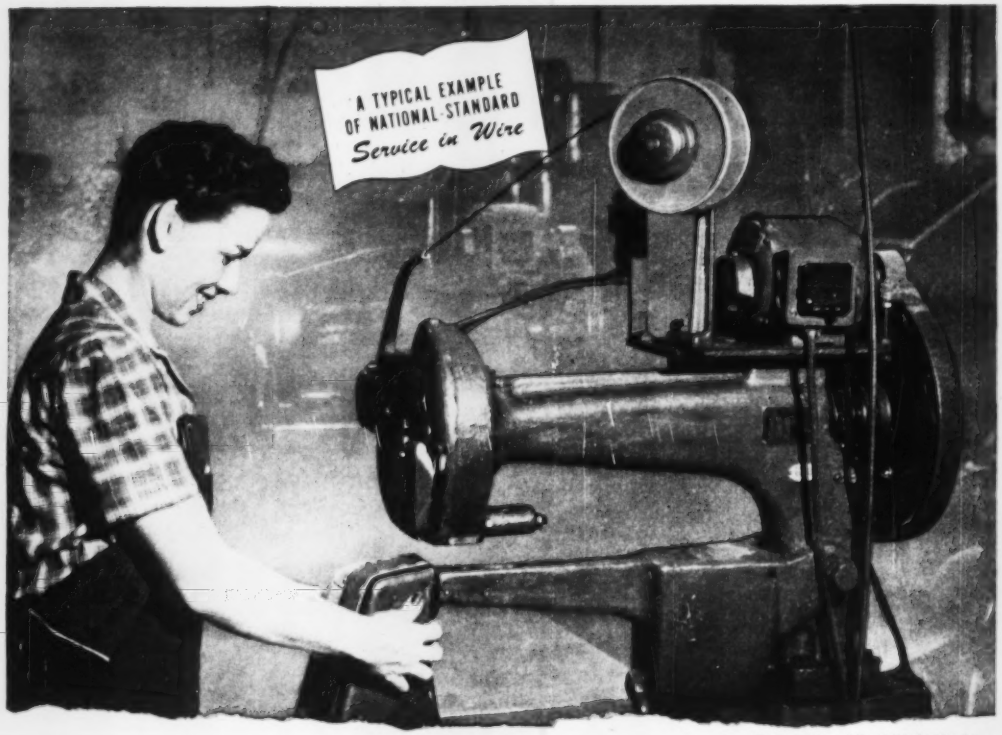


Photo courtesy of Woodall Industries, Inc.

A stitch in metal saves *plenty!*

STITCHING with wire is a relatively new way of joining metal to metal, or metal to almost any other material. Since speeds up to 100 stitches a minute are possible . . . and since wire is economical . . . there are tremendous time-and-cost savings compared with other methods of fabrication.

Success of the whole idea hinges largely on special wire. For the wire must be *stiff* to penetrate metal. It has to be *strong*, up to 330,000 psi in tensile strength, to provide a lasting grip. Still it must be *ductile* to take tight 180° bends without cracking or breaking.

Here, at our Worcester Wire Works Division, this unusual wire is produced in several strengths, sizes and finishes to meet all metal stitching requirements perfectly! Here too, the skill and care for which Worcester Wire Works has long been known result in exceptional uniformity — a particularly great advantage for any user of machine-fed wire.

Do you have a problem involving wire? Perhaps, as in metal stitching, a new, specially developed wire is the answer. Maybe you need only some specialized engineering help on the use or fabrication of wire. In any case, Worcester Wire Works stands ready to serve you, to give you the advantage of engineering experience, special skills and techniques that have been over 50 years in the making. It's your standing invitation to out-of-the-ordinary, personalized service in wire.

NS
NATIONAL-STANDARD Company
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DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL	*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL STANDARD	*Niles, Mich.*	Tire Wire, Stainless, Fabricated Braids and Tape
REYNOLDS WIRE	*Dixon, Illinois*	Industrial Wire Cloth
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

The Market Outlook

ELEVEN DAYS from now it'll cost some consumers more to get steel from the mill.

This is because railroad freight rates are going up again May 2.

Sale of steel from mills is generally on an f.o.b. mill basis, thus leaving it to the buyer to pay the freight charges. Consequently, those who get their steel by rail will be hit.

This freight rate increase won't show up though until June 16 in prices of steel sold by warehouses. Under government pricing regulations, freight charges between mills and warehouses are passed on to the warehouse customers, but the freight costs for one calendar month cannot be reflected in warehouse prices until the sixteenth day following a calendar month. Thus, freight costs incurred by warehouses in May will be used in computing warehouse sales prices for the period of from June 16 to July 15.

The railroad freight rate increase effective on steel May 2 will be 6 per cent over the year-ago rate in the East and 9 per cent over the year-ago rate in the South and West. These amounts complete the 15 per cent boost the railroads wanted over the year-ago level.

COSTLY—These freight rate increases will also add many millions of dollars onto the steel industry's costs of doing business, for the rate increases will apply to raw materials used by steel producers.

The increase in freight rates, along with costs stemming from the preparations for a steel strike and additional accounting costs in connection with government operation of the steel companies, will hurt the earnings of the steel industry in the second quarter. Producers indicate their earnings in the first quarter of this year will be below those of the comparable period of last year. And last year, as a whole, was not as good as the year before. STEEL's 27th Annual Financial Analysis of the Steel Industry, published today, shows the industry's sales and revenues in 1951 were 21.8 per cent over those of 1950 but net profit was down 12.9 per cent.

REVIVAL—By the end of the week, the steel industry's operations were back up almost to the high level prevailing before they were dropped in anticipation of a steel strike. STEEL estimates the production of steel for ingots and castings during the week ended Apr. 19 was at a rate of 96.5 per cent of capacity. This yielded 2,004,000 net tons.

Progress toward a balance between steel supply and demand continues and is reflected in government thinking on controls. Government controllers reveal that controls soon will be taken off most secondary tin mill products. Also, the controllers are considering a Tin Plate Industry Advisory Committee request that black plate be freed from restrictions.

CHANGE OF PACE—The Defense Production Administration is increasing allotments of structural steel to some classes of consumers for third quarter.

Reinforcing steel, which has been in very strong demand, is significantly easier in supply in Chicago. Whether this is resulting from government restrictions on construction remains to be seen.

Another reflector of the lessening of pressure for steel supplies is steelmaking scrap. Shipments to mills are increasing, quality is improved and mills' ground stocks of scrap are growing. On the West Coast, some dealers feel it will not be long before No. 2 bundles will be selling under the ceiling.

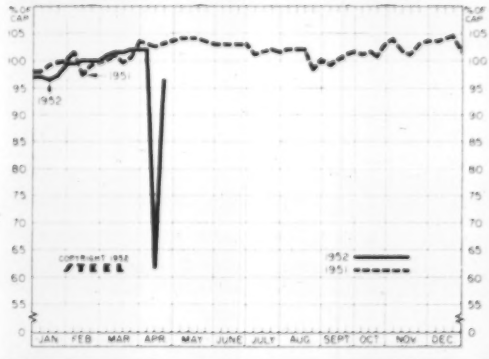
TIGHT SPOTS—Carbon bars, particularly the larger sizes, are probably the most critical steel product now. A close runnerup are heavy and wide plates.

Carbon sheets and strip are among the easier items, but regular price mills are booked up well on them.

Some pickup in demand for wire is noted but the supply of most standard products and many specialties exceeds requirements.

Pig iron sellers are able to dispose of all their output but they are under less pressure for tonnage because defense work in the foundries is not filling in the gap left by a drop in civilian work.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Apr. 19	Change	Same Week 1951	1950
Pittsburgh	102	+ 8.0*	102	103
Chicago	94	+ 11.5*	100	103
Mid-Atlantic	95	+ 17	100.5	95
Youngstown	95	+ 5.5	106	106
Wheeling	101.5	+ 12.5*	97	102.5
Cleveland	99	+ 4.5*	103.5	99.5
Buffalo	104	+ 6.0	104	104
Birmingham	102	+ 5.2	100	100
New England	85	+ 1.8	91	87
Cincinnati	94	+ 3.8	105	102
St. Louis	90	+ 16.5	95	84.5
Detroit	106	+ 1.5	105	102
Western	91	+ 1.5*	100.5	95
Estimated national rate	96.5	+ 3.5*	103	98

Based on weekly steelmaking capacity of 2,077,040 tons in 1952, 1,966,604 tons for 1951, 1,928,721 tons for second half, 1950, 1,906,265 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 43 Production Engineering News—p. 79

Composite Market Averages

FINISHED STEEL INDEX, Weighted

	Apr. 17 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 = 100)	171.92	171.92	171.92	171.92	118.67
Index in cents per lb.	4.657	4.657	4.657	4.657	3.215

ARITHMETICAL PRICE COMPOSITES

Finished Steel, GT	$106.32	$106.32	$106.32	$106.32	$69.82
No. 2 Fdry. Pig Iron, GT	52.54	52.54	52.54	52.24	32.09
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	32.49
Malleable Pig Iron, GT	53.27	53.27	53.27	53.27	33.71
Steelmaking Scrap, GT	44.00	44.00	44.00	44.00	33.92

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Preliminary.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Apr. 17 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelphia	4.223	4.223	4.223	4.20	2.98
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, Std., del. Philadelphia	3.918	3.918	3.918	3.93	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.60
Plates, Chicago	3.70	3.70	3.70	3.70	2.60
Plates, Coatesville, Pa.	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.60
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.60-75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh	5.00-6.20	5.00-6.20	5.00-6.20	5.00-6.20	4.125
Tin plate box, Pittsburgh	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts. (NT	$66.00	$66.00	$66.00	$66.00	$40.00
Wire rods, Pitts.	4.10-4.30	4.10-4.30	4.10-4.30	4.10-4.30	2.90

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$34.00
Basic, Valley	52.00	52.00	52.00	52.00	33.00
Basic, del. Phila.	56.61	56.61	56.61	56.48	35.52
No. 2 Fdry., Pitts.	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry., Chicago	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry., Valley	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry. del. Phila.	57.11	57.11	57.11	56.99	36.02
No. 2 Fdry., Birm.	48.88	48.88	48.88	48.88	29.88
No. 2 Fdry. (Birm.) del. Cin.	55.49	55.49	55.49	55.33	34.75
Malleable, Valley	52.50	52.50	52.50	52.50	33.50
Malleable, Chicago	52.50	52.50	52.50	52.50	33.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	40.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.23*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$45.00	$17.00
No. 1 Heavy Melt., E. Pa.	42.50	42.50	42.50	43.50	13.50
No. 1 Heavy Melt., Chicago	42.50	42.50	42.50	43.50	13.25
No. 1 Heavy Melt., Valley	44.00	44.00	44.00	45.00	13.25
No. 1 Heavy Melt., Cleve.	43.00	43.00	43.00	44.00	14.75
No. 1 Heavy Melt., Buffalo	43.00	43.00	43.00	44.00	14.00
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	18.50
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	49.00*	42.50

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connlsvl.	$14.75	$14.75	$14.75	$14.75	$8.25-9.50
Beehive, Fdry. Connlsvl.	17.50	17.50	17.50	17.50	9.75-11.00
Oven, Fdry., Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	21.50
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	18.80	18.80	18.80	16.80-14.80	14.85
Tin, New York	121.50	121.50	121.50	142.00	80.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex.	50.00	50.00	50.00	42.00	33.00
Nickel, refinery, duty paid	56.50	56.50	56.50	50.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.		59.18	59.68	
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	
Birmingham, R2	48.38	48.88	....	
Birmingham, S9	48.38	48.88	....	
Woodward, Ala. W15	48.38	48.88	....	
Cincinnati, del.	....	55.49	....	
Buffalo District				
Buffalo, R2	52.00	52.50	53.00	....
Buffalo, H1	52.00	52.50	53.00	....
Tonawanda, N.Y., W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y., T9		52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago, I-3	52.00	52.50	52.50	53.00
Gary, Ind., U5	52.00	....	52.50	....
Indiana Harbor, Ind., I-2	52.00	....	52.50	....
So. Chicago, Ill., V14	52.00	52.50	52.50	....
So. Chicago, Ill., Y1	52.00	52.50	52.50	....
So. Chicago, Ill., U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland, A7	52.00	52.50	52.50	53.00
Cleveland, R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O., N3	52.00	....	52.50	53.00
Duluth, I-3	....	....	52.50	....
Erie, Pa., I-3	52.00	52.50	52.50	53.00
Everett, Mass., E1	....	59.75	60.25	....
Fontana, Calif., K1	58.00	58.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
Los Angeles, San Francisco, del.	60.16	60.66	....	....
Granite City, Ill., G4	53.00	54.00	54.00	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah, C11	52.00	52.50	....	....
Geneva, Utah, C11	52.00	52.50	....	....
LoneStar, Tex., L6	48.00	*48.50	48.50	....
Minnequa, Colo., C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa., P9		52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.		53.80	53.80	54.30
McKeesRocks, del.		53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.		54.07	54.07	54.57
Verona, del.		54.57	54.57	55.07
Brackenridge, del.		54.82	54.82	55.32
Bessemer, Pa., U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa., U5	52.00	....	....	....
McKeesport, Pa., N3	52.00	....	....	53.00
Monessen, Pa., P7	54.00	....	....	....
Sharpsville, Pa., S6	....	....	52.50	53.00
Steelton, Pa., B2	54.00	54.50	55.00	55.50
Sweedeland, Pa., A3	56.00	56.50	57.00	57.50
Toledo, O., I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y., R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O., Y1	52.00	52.50	52.50	....
Youngstown, Y1	52.00	52.50	52.50	....
Youngstown, U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos., southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%; except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O., G2, J1	$62.50
Buffalo, H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y., P15	$88.00
Keokuk, Iowa, Openhearth & Fdry., frt. allowed, K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 1% Si, frt. allowed, K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed, K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-coid blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn., T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa., B2	60.00
Philadelphia, delivered	63.37
Troy, N.Y., R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Apr. 17, 1952, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company, key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $79.00
Munhall,Pa. U5 ... 52.00

INGOTS, Alloy (NT)
Detroit R1 ... $54.00
Fontana,Calif. K1 ... 80.00
Houston, S5 ... 62.00
Midland,Pa. C18 ... 54.00
Munhall,Pa. U5 ... 54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. C6 ... $56.00
Clairton,Pa. U5 ... 56.00
Ensley,Ala. T2 ... 56.00
Fairfield,Ala. T2 ... 56.00
Fontana,Calif. K1 ... 74.00
Gary,Ind. U5 ... 56.00
Johnstown,Pa. B2 ... 56.00
Lackawanna,N.Y. B2 ... 56.00
Munhall,Pa. U5 ... 56.00
So.Chicago,Ill. U5 ... 56.00
So.Duquesne,Pa. U5 ... 56.00

Carbon, Forging (NT)
Bessemer,Pa. C6 ... $66.00
Buffalo R2 ... 66.00
Canton,O. R2 ... 66.00
Clairton,Pa. U5 ... 66.00
Cleveland R2 ... 66.00
Conshohocken,Pa. A3 ... 73.00
Detroit R7 ... 69.00
Ensley,Ala. T2 ... 66.00
Fairfield,Ala. T2 ... 66.00
Fontana,Calif. K1 ... 86.00
Gary,Ind. U5 ... 66.00
Geneva,Utah C11 ... 66.00
Houston, S5 ... 74.00
Johnstown,Pa. B2 ... 66.00
Lackawanna,N.Y. B2 ... 66.00
LosAngeles B3 ... 86.00
Munhall,Pa. U5 ... 66.00
Seattle B3 ... 86.00
So.Chicago R2,U5,W14 ... 66.00
So.Duquesne,Pa. U5 ... 66.00
So.SanFrancisco B3 ... 86.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... $70.00
Buffalo R2 ... 70.00
Canton,O. R2 ... 70.00
Canton,O.(2%) T7 ... 66.00
Conshohocken,Pa. A3 ... 77.00
Detroit R7 ... 73.00
Fontana,Calif. K1 ... 89.00
Gary,Ind. U5 ... 70.00
Houston, S5 ... 78.00
Ind.Harbor,Ind. Y1 ... 70.00
Johnstown,Pa. B2 ... 70.00
Lackawanna,N.Y. B2 ... 70.00
Los Angeles, B3 ... 90.00
Massillon,O. R2 ... 70.00
Midland,Pa. C18 ... 70.00
Munhall,Pa. U5 ... 70.00
So.Chicago R2,U5,W14 ... 70.00
So.Duquesne,Pa. U5 ... 70.00
Struthers,O. Y1 ... 70.00
Warren,O. C17 ... 70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ... $82.00
Cleveland R2 ... 82.00
Fontana,Calif. K1 ... 103.00
Gary,Ind. U5 ... 82.00
Massillon,O. R2 ... 82.00
So.Chicago,Ill. R2 ... 82.00
So.Duquesne,Pa. U5 ... 82.00

SHEET BARS (NT)
Fontana,Calif. K1 ... $89.00

SKELP
Aliquippa,Pa. J5 ... $3.45
Munhall,Pa. U5 ... 3.35
Warren,O. R2 ... 3.35
Youngstown R2, U5 ... 3.35

WIRE RODS
Alton,Ill. L1 ... 4.40
AlabamaCity,Ala. R2 ... 4.10
Buffalo W12 ... 4.10
Cleveland A7 ... 4.10
Donora,Pa. A7 ... 4.10
Fairfield,Ala. T2 ... 4.10
Fontana,Calif. K1 ... 4.90
Houston, S5 ... 4.50
Johnstown,Pa. B2 ... 4.10
Joliet,Ill. A7 ... 4.10
LosAngeles B3 ... 4.90
Minnequa,Colo. C10 ... 4.35
Monessen,Pa. P7 ... 4.30
So.Tonawanda,N.Y. B11 ... 4.10
Pittsburg,Calif. C11 ... 4.75
Portsmouth,O. P12 ... 4.30
Roebling,N.J. R5 ... 4.20
So.Chicago,Ill. R2 ... 4.10
SparrowsPoint,Md. B2 ... 4.20
Sterling,Ill.(1) N15 ... 4.10
Struthers,O. Y1 ... 4.10
Torrance,Calif. C11 ... 4.90
Worcester,Mass. A7 ... 4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.45
Lackawanna,N.Y. B2 ... 4.45
Munhall,Pa. U5 ... 4.45
So.Chicago,Ill. U5 ... 4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.60
Aliquippa,Pa. J5 ... 3.65
Bessemer,Ala. T2 ... 3.65
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fairfield,Ala. T2 ... 3.65
Fontana,Calif. K1 ... 4.25
Gary,Ind. U5 ... 3.65
Geneva,Utah C11 ... 3.65
Houston, S5 ... 4.05
Ind.Harbor,Ind. I-2 ... 3.65
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S6 ... 4.25
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.25
Minnequa,Colo. C10 ... 4.10
Munhall,Pa. U5 ... 3.65
Niles,Calif.(22) P1 ... 4.85
Phoenixville,Pa. P4 ... 3.90
Portland,Oreg. O4 ... 4.50
Seattle B3 ... 4.30
So.Chicago,Ill. U5, W14 ... 3.65
So.SanFrancisco B3 ... 4.20
Torrance,Calif. C11 ... 4.25
Weirton,W.Va. W6 ... 3.90

Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.35
Fontana,Calif. K1 ... 5.00
Munhall,Pa. U5 ... 4.35
So.Chicago,Ill. U5 ... 4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 5.50
Bessemer,Ala. T2 ... 5.50
Bethlehem,Pa.(14) B2 ... 5.50
Clairton,Pa. U5 ... 5.50
Fairfield,Ala. T2 ... 5.50
Fontana,Calif. K1 ... 6.10
Gary,Ind. U5 ... 5.50
Geneva,Utah C11 ... 5.50
Ind.Harbor,Ind. I-2 ... 5.50
Johnstown,Pa. B2 ... 6.00
Lackawanna,N.Y.(14) B2 ... 5.50
LosAngeles B3 ... 6.05
Munhall,Pa. U5 ... 5.50
Seattle B3 ... 6.10
So.Chicago,Ill. U5 ... 5.50
So.SanFrancisco B3 ... 6.00
Struthers,O. Y1 ... 6.00

Wide Flange
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fontana,Calif. K1 ... 4.65
Lackawanna,N.Y. B2 ... 3.70
Munhall,Pa. U5 ... 3.65
So.Chicago,Ill. U5 ... 3.65

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 ... 5.50
Lackawanna,N.Y. B2 ... 5.50
Munhall,Pa. U5 ... 5.45
So.Chicago,Ill. U5 ... 5.45

BEARING PILES
Munhall,Pa. U5 ... 3.60
So.Chicago,Ill. U5 ... 3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.65
Bessemer,Ala. T2 ... 5.65
Clairton,Pa. U5 ... 5.65
Cleveland J5, R2 ... 5.65
Conshohocken,Pa. A3 ... 5.90
Fairfield,Ala. T2 ... 5.60
Fontana,Calif.(30) K1 ... 6.25
Gary,Ind. U5 ... 5.65
Geneva,Utah C11 ... 5.65
Ind.Harbor,Ind. I-2 ... 5.65
Ind.Harbor,Ind. Y-1 ... 6.15
Johnstown,Pa. B2 ... 5.65
Munhall,Pa. U5 ... 5.65
Pittsburgh J5 ... 5.65
Seattle B3 ... 6.50
Sharon,Pa. S3 ... 5.70
So.Chicago,Ill. U5 ... 5.65
SparrowsPoint,Md. B2 ... 5.65
Warren,O. R2 ... 5.65
Youngstown Y1 ... 6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ... 4.85
Coatesville,Pa. C7 ... 5.25
Conshohocken,Pa. A3 ... 5.05
Fontana,Calif. K1 ... 5.70
Gary,Ind. U5 ... 4.75
Johnstown,Pa. B2 ... 4.75
Munhall,Pa. U5 ... 4.75
Sharon,Pa. S3 ... 5.20
So.Chicago,Ill. U5 ... 4.75
SparrowsPoint,Md. B2 ... 4.75

FLOOR PLATES
Cleveland J5 ... 4.75
Conshohocken,Pa. A3 ... 4.75
Ind.Harbor,Ind. I-2 ... 4.75
Munhall,Pa. U5 ... 4.75
So.Chicago,Ill. U5 ... 4.75

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ... 3.95
Ashland,lcl (15) A10 ... 4.45
Cleveland,c.l. R2 ... 4.30
Warren,O.c.l. R2 ... 4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Ashland,Ky. (15) A10 ... 3.70
Bessemer,Ala. T2 ... 3.70
Clairton,Pa. U5 ... 3.70
Claymont,Del. C22 ... 4.15
Cleveland J5, R2 ... 3.70
Coatesville,Pa. C7 ... 4.15
Conshohocken,Pa. A3 ... 4.10
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. (30) K1 ... 4.30
Gary,Ind. U5 ... 3.70
GraniteCity,Ill. G4 ... 4.40
Geneva,Utah C11 ... 3.70
Harrisburg,Pa. C5 ... 4.20
Houston, S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Minnequa,Colo. C10 ... 4.30
Munhall,Pa. U5 ... 3.70
Pittsburgh J5 ... 3.70
Seattle B3 ... 4.60
Sharon,Pa. S3 ... 3.95
So.Chicago,Ill. U5, W14 ... 3.70
SparrowsPoint,Md. B2 ... 3.70
Steubenville,O. W10 ... 3.70
Warren,O. C17 ... 3.70
Weirton,W.Va. W6 ... 4.00
Youngstown R2, U5, Y1 ... 3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 ... 5.45
Geneva,Utah C11 ... 4.85

PLATES, Wrought Iron
Economy,Pa. B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Alton,Ill. L1 ... 4.15
Atlanta,Ga. A11 ... 4.25
Bessemer,Ala. T2 ... 3.70
Buffalo R2 ... 3.70
Canton,O. R2 ... 3.70
Clairton,Pa. U5 ... 3.70
Cleveland R2 ... 3.70
Detroit R7 ... 3.85
Emeryville,Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston, S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S6 ... 4.30
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.15
Niles,Calif. P1 ... 5.05
N.Tonawanda,N.Y. B11 ... 3.70
Pittsburg,Calif. C11 ... 4.40
Pittsburgh J5 ... 3.70
Portland,Oreg. O4 ... 4.45
Seattle B3, R14 ... 4.45
Struthers,O. Y1 ... 3.70
Torrance,Calif. C11 ... 4.40
Weirton,W.Va. W6 ... 3.85
So.Chicago R2, U5, W14 ... 3.70
So.Duquesne,Pa. U5 ... 3.70
So.SanFrancisco B3 ... 4.40
Youngstown R2, U5 ... 3.70

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 ... 3.70
Atlanta,Ala. A11 ... 4.25
Johnstown,Pa. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Niles,Calif. P1 ... 5.05
Portland,Oreg. O4 ... 4.45
SanFrancisco B7 ... 4.85

BAR SIZE ANGLES, H.R. CARBON
Bethlehem,Pa. B2 ... 3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.30
Buffalo R2 ... 4.30
Canton,O. R2 ... 4.30
Canton,O.(29) T7 ... 3.95
Clairton,Pa. U5 ... 4.30
Detroit R7 ... 4.45
Ecorse,Mich. G5 ... 4.65
Fontana,Calif. K1 ... 5.35
Gary,Ind. U5 ... 4.30
Houston, S5 ... 4.70
Ind.Harbor,Ind. I-2, Y1 ... 4.30
Johnstown,Pa. B2 ... 4.30
KansasCity,Mo. S6 ... 4.90
Lackawanna,N.Y. B2 ... 4.30
LosAngeles B3 ... 5.35
Massillon,O. R2 ... 4.30
Midland,Pa. C18 ... 4.30
So.Chicago R2, U5, W14 ... 4.30
So.Duquesne,Pa. U5 ... 4.30
Struthers,O. Y1 ... 4.30
Warren,O. C17 ... 4.30
Youngstown U5 ... 4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.55
Gary,Ind. U5 ... 4.55
Youngstown U5 ... 4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.55
Bessemer,Ala. T2 ... 5.55
Bethlehem,Pa. B2 ... 5.50
Clairton,Pa. U5 ... 5.55
Cleveland R2 ... 5.55
Fairfield,Ala. T2 ... 5.55
Fontana,Calif. K1 ... 6.60
Gary,Ind. U5 ... 5.55
Ind.Harbor,Ind. I-2 ... 5.55
IndianaHarbor,Ind. Y1 ... 6.05
Johnstown,Pa. B2 ... 5.55
Lackawanna,N.Y. B2 ... 5.55
LosAngeles B3 ... 6.25
Pittsburgh J5 ... 5.55
Seattle B3 ... 6.30
So.Duquesne,Pa. U5 ... 5.55
So.SanFrancisco B3 ... 6.30
Struthers,O. Y1 ... 6.05
Youngstown U5 ... 5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ... 4.55
BeaverFalls,Pa. M12,R2 ... 4.55
Buffalo B5 ... 4.60
Camden,N.J. P13 ... 5.00
Carnegie,Pa. C12 ... 4.55
Chicago W18 ... 4.55
Cleveland A7, C20 ... 4.55
Detroit P17 ... 4.70
Donora,Pa. A7 ... 4.55
Elyria,O. W8 ... 4.55
FranklinPark,Ill. N5 ... 4.55
Gary,Ind. R2 ... 4.55
GreenBay,Wis. F7 ... 4.55
Hammond,Ind. I-2, M13 ... 4.55
Hartford,Conn. R2 ... 5.10
Harvey,Ill. B5 ... 4.55
LosAngeles B3 ... 6.00
Mansfield,Mass. B5 ... 5.10
Massillon,O. R2, R8 ... 4.55
Monaca,Pa. S17 ... 4.55
Newark,N.J. W18 ... 5.00
Plymouth,Mich. P5 ... 4.80
Pittsburgh J5 ... 4.55
Putnam,Conn. W18 ... 5.10
Readville,Mass. C14 ... 5.10
St.Louis,Mo. M5 ... 4.95
So.Chicago,Ill. W14 ... 4.55
SpringCity,Pa. (5) K3 ... 5.00
Struthers,O. Y1 ... 4.55
Waukegan,Ill. A7 ... 4.55
Youngstown R3, Y1 ... 4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ... 5.40
BeaverFalls,Pa. M12 ... 5.40
Bethlehem,Pa. B2 ... 5.40
Buffalo B5 ... 5.40
Camden,N.J. P13 ... 5.50
Canton,O. R2 ... 5.40
Canton,O.(29) T7 ... 4.90
Carnegie,Pa. C12 ... 5.40
Chicago W18 ... 5.40
Cleveland A7 ... 5.45
Detroit P17 ... 5.55
Donora,Pa. A7 ... 5.45
Elyria,O. W8 ... 5.40
Gary,Ind. R2 ... 5.40
Hammond,Ind. I-2, M13 ... 5.40
Harvey,Ill. B5 ... 5.40
Lackawanna,N.Y. B2 ... 5.40
Mansfield,Mass. B5 ... 5.85
Massillon,O. R2, R8 ... 5.40
Midland,Pa. C18 ... 5.40
Monaca,Pa. S17 ... 5.40
Newark,N.J. W18 ... 5.75
Plymouth,Mich. P5 ... 5.60
So.Chicago,Ill. R2, W14 ... 5.40
Struthers,O. Y1 ... 5.40
Warren,O. C17 ... 5.40
Waukegan,Ill. A7 ... 5.45
Worcester,Mass. A7 ... 5.75
Youngstown F3, Y1 ... 5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ... 4.75
ChicagoHts.(3,4) I-2 ... 4.75
Franklin,Pa. (3,4) F5 ... 4.75
FortWorth,Tex.(26) T4 ... 4.85
Huntington,W.Va.(3) W7 ... 5.50
Marion,O.(3) P11 ... 4.75
Moline,Ill.(3) R2 ... 3.80
Tonawanda(3,4) B12 ... 4.75
Williamsport(3) S19 ... 5.00
Williamsport,(4) S19 ... 5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 ... 15.00
Dover,(Eng.Bolt) U1 ... 13.50
Dover,(Wrgh.Iron) U1 ... 12.25
Economy,Pa.(S.R.) B14 ... 9.60
Economy,Pa.(D.R.)B14 ... 11.90
Economy,(Staybolt)B14 ... 12.20
McK.Rks.(Staybolt)L5 ... 14.50
McK.Rks.(S.R.) L5 ... 9.60
McK.Rks.(D.R.) L5 ... 13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.70
Atlanta A11 ... 4.25
Buffalo R2 ... 3.70
Cleveland R2 ... 3.70
Emeryville,Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston, S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S6 ... 4.30
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.15
Niles,Calif. P1 ... 5.05
Pittsburg,Calif. C11 ... 4.40
Pittsburgh J5 ... 3.70
Portland,Oreg. O4 ... 4.45
Seattle B3 ... 4.45
Sharon,Pa. S3 ... 3.95
So.SanFrancisco B3 ... 4.40
Struthers,O. Y1 ... 3.70
Torrance,Calif. C11 ... 4.40
Youngstown R3, U5, Y1 ... 3.70

BARS, Reinforcing (Mills)
Buffalo R2 ... 3.70
Cleveland R2 ... 3.70
Emeryville,Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston, S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S6 ... 4.30
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.15
Niles,Calif. P1 ... 5.05
Pittsburg,Calif. C11 ... 4.40
Pittsburgh J5 ... 3.70
Portland,Oreg. O4 ... 4.45
Seattle B3 ... 4.45
Sharon,Pa. S3 ... 3.95
So.SanFrancisco B3 ... 4.40
Struthers,O. Y1 ... 3.70
Torrance,Calif. C11 ... 4.40
Youngstown R3, U5, Y1 ... 3.70

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ... 4.75
Dover,O. R1 ... 5.65
Ind.Harbor,Ind. I-2 ... 5.40
Mansfield,O. E6 ... 5.65
Niles,O. N12 ... 5.75
Torrance,Calif. C11 ... 5.40

SHEETS, H.R. (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 ... 5.40
Conshohocken,Pa. A3 ... 5.65
Ecorse,Mich. G5 ... 5.95
Fairfield,Ala. T2 ... 5.40
Fontana,Calif. K1 ... 6.35
Gary,Ind. U5 ... 5.40
Ind.Harbor,Ind. I-2 ... 5.40
Ind.Harbor,Ind. Y1 ... 5.90
Irvin,Pa. U5 ... 5.40
Lackawanna(35) B2 ... 5.40
Pittsburgh J5 ... 5.40
Sharon,Pa. S3 ... 5.40
So.Chicago,Ill. U5 ... 5.40
SparrowsPoint(36) B2 ... 5.40
Warren,O. R2 ... 5.40
Weirton,W.Va. W6 ... 5.75
Youngstown U5 ... 5.40
Youngstown Y1 ... 5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 ... 6.65
Ecorse,Mich. G5 ... 7.10
Fontana,Calif. K1 ... 7.50
Gary,Ind. U5 ... 6.55
IndianaHarbor,Ind. Y1 ... 7.05
IndianaHarbor,Ind. I-2 ... 6.55
Irvin,Pa. U5 ... 6.55
Lackawanna(37) B2 ... 6.55
Pittsburgh J5 ... 6.55
SparrowsPoint(38) B2 ... 6.55
Warren,O. R2 ... 6.55
Weirton,W.Va. W6 ... 6.90
Youngstown Y1 ... 7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Buffalo,Pa. A10	4.35
Cleveland,O. R2	4.35
Ecorse,Mich. G6	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	4.35
Fontana,Calif. K1	4.50
Gary,Ind. U5	4.35
Granite City,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh,Pa. J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown,O. Y1	4.35

SHEETS, Gal'd No. 10 Steel

Aliquippa,Pa. J5	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
Granite City,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(29) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.45
Irvin,Pa. U5	5.45
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland,R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland,R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown,O. Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.25
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.80
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16	Cu	Cu Alloy
Ashland,Ky. A10	5.60	5.85
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary,Ind. U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	-
MartinsFy.O. W10	5.60	5.85
Pittsburg,Calif. C11	6.35	-
SparrowsPt. B2	5.60	-
Torrance,Calif. C11	6.35	-

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland,R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland,R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har.,Ind. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEET, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles (25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.60
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.50
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.60
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1			7.70	9.65	
Carnegie,Pa. S18		6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65		
Detroit D2	5.60	6.65	7.25		
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18			7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35		
NewYork W3		7.10	7.70	9.65	11.95
Pawtucket,R.I. NS: Cleve.orPitts Base		6.80	7.40	9.35	11.65
Worcester,Mass. Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5		7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester, Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8		6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5			10.30	12.50	15.35
Harrison,N.J. C18			10.30	12.50	15.35
NewYork W3			10.30	12.50	15.35

STRIP, Hot-Rolled Carbon

Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S3	5.85
Youngstown U5	5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5	5.25
NewHaven,Conn. D2	5.85
Newffaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) NS	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R. (22 Ga.) COILS (Cut Lengths 1/2c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va.(cut lengths)			7.25	8.50	9.30
Brackenridge,Pa. A4			7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)			7.95	9.20	
Ind.Harbor,Ind. I-2	6.95	7.25	(34)		
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)		6.75	7.25		
Vandergrift,Pa. U5		7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10		7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths 1/2c lower) Transformer Grade	72	65	58	52
BeechBottom,W.Va.(cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35			
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35			
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (5" ID)			14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Bacock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B6 Bliss & Laughlin Inc.
B7 Bourdi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Jonhson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeport,Conn.(10)#S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.60
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10)#S15	10.75
Pawtucket,R.I.(11) NS	10.75
Pawtucket,R.I.(12) NS	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.50
Youngstown C8	10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.00
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa,Pa. J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	
Cleveland A7	5.70	6.15
Crawfordsville,MS	5.95	6.40
Donora,Pa. A7	6.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCity,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	
Pitts.,Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
SparrowsPt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	
Worcester A7	6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
BuffaloW12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Muncie,Ind. I-7	8.75	9.00
Palmer,Mass W12	8.85	9.10
Portsmouth,O.P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.55	8.80
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill. L1	5.05
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. MS	5.10
Donora,Pa. A7	4.85
Duluth,Minn. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.85
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark 6-8 ga. I-1	5.50
No.Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. MS	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) NS	6.85
Trenton,N.J. R5	6.15
Worcester,Mass. A7	6.15
Worcester,Mass. T6	6.50
Worcester,Mass. W12	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Muncie,Ind. I-7	8.70
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1)K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsville MS	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth (18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.45
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Muncie,Ind. I-7	6.45
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.35
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. MS	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Muncie,Ind. I-7	9.10
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	141
Atlanta A11	144
Bartonville,Ill.(19) K4	144
Crawfordsville,Ind. MS	146
Donora,Pa. A7	141
Duluth,Minn. A7	141
Fairfield,Ala. T2	141
Houston,Tex. S5	149
Johnstown,Pa. B2	141
Joliet,Ill. A7	141
KansasCity,Mo. S5	153
Kokomo,Ind. C16	143
Minnequa,Colo. C10	147
Monessen,Pa. P7	146
Pittsburg,Calif. C11	161
Portsmouth,O.(18) P12	148
Rankin,Pa. A7	141
So.Chicago,Ill. R2	137
So.SanFran.,Calif. C10	161
SparrowsPoint,Md. B2	143
Sterling,Ill.(1) N15	141

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	128
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. MS	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill. L1	6.10
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth,Minn. A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½Ga. Col.

AlabamaCity,Ala. R2	127
Ala.City,Ala.,17-18ga.R2	214
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	134
Bartonville,Ill.(19) K4	131
Crawfordsville,Ind. MS	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Johnstown,17ga. 6" B2	205
Johnstown,17ga. 4" B2	208
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	139
Monessen,Pa. P7	136
Pittsburg,Calif. C11	154
Portsmouth,O.(18) P12	138
Rankin,Pa. A7	131
So.Chicago,Ill. R2	127
Sterling,Ill.(1) N15	131

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	125
Frankin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	130

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(3) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.35

RAILS

Bessemer,Pa. U5	
Ensley,Ala. T2	
Fairfield,Ala. T2	
Gary,Ind. U5	
Huntington,W.Va. W7	
Ind.Harbor,Ind. I-2	
Johnstown,Pa. B2	
Lackawanna,N.Y. B2	
Minnequa,Colo. C10	
Steelton,Pa. B2	
Williamsport,Pa. S19	

NAILS & STAPLES, Stock

To dealers & mfrs.(7)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonvill,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. MS	122
Donora,Pa. A7	118
Duluth, Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. 10	7.35

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2 Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.60
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

AXLES

Ind.Harbor,Ind. S13	5.60
Johnstown,Pa. B2	5.60

	Std. No. 1	Std. No. 2	All No. 2	Too Rails 60 lb Under
	3.60	3.50	3.55	4.00
	3.60	3.50		4.00
				4.00
	3.60	3.50	3.55	
				5.00
	3.60	3.50	3.55	
				(16)4.00
	3.60	3.50		4.00
	3.60	3.50		4.50
	3.60	3.50		
				4.75

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Northwest. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simonds Co.
S8 Simonds Saw & Steel Co.
S9 Sioss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 YoungstownSheet&Tube

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co		
18	4	1			1.505
18	4	2			1.650
20 25	4 25	1 6	12 25	3 535-	3.675
19	4	2	7		2.460
18 25	4 25	1	4 75		2.125
18	4	2	9	2.445-	2.45
13 5	4	3			1.6025
W	Cr	V	Mo		
6 4	4 5	1 9 2		0.96-	0.965
6	4	3	6		1.190
1 5	4	1	8 5		0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 5 cols. lower.
(8) 14 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Plate only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, for fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Reinforced.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 12" and narrower.
(36) 24" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.025"; 0.025" and heavier 0.25c higher.

"Buffalo" Tips on the Care of AIR EQUIPMENT

1 PROTECTIVE COATING FOR LONGER FAN LIFE

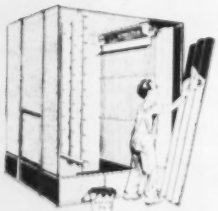
The life of any fan will be greatly lengthened by frequent inspections, cleaning and painting of its wheel and housing. For ordinary ventilating jobs where moist air is handled, asphalt or bitumastic paint proves satisfactory.

However, for fans handling severely corrosive gases, rubber lining, as in the "Buffalo" Exhauster at left, preserves the metal.

Many "Buffalo" Fans for the chemical and steel industries today are supplied in stainless steel. There's a "Buffalo" Fan for your specific air job—write for the facts now!

2 KEEPING THE AIR WASHER AT ITS BEST

A regular program of cleaning and painting as illustrated below is excellent preventive maintenance. This prevents scaling and corrosion due to evaporation of water which contains large quantities of dissolved solids. Regular maintenance, plus good basic design, are the reasons why many of the original "Buffalo" Air Washers are still in active service after more than fifty years.



Air washer eliminator plates should be painted yearly or oftener if necessary.

Frequent cleaning and flushing prevents corrosion.

One of the latest "Buffalo" Air Washers ready for shipment. For the answer to your air washing or humidification problem, write for Bulletin 5181-B.

FIRST FOR FANS

"Buffalo" BUFFALO FORGE COMPANY

158 MORTIMER ST. BUFFALO, NEW YORK

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont. Sales Representatives in all Principal Cities

VENTILATING FORCED DRAFT | AIR CLEANING COOLING | AIR TEMPERING HEATING | INDUCED DRAFT PRESSURE BLOWING | EXHAUSTING

STANDARD PIPE, T & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.56	0.24	34.0	32.0	...	-0.5	-2.5	...
¼	6.60	0.42	28.5	26.5	...	-3.5	-5.5	...
⅜	8.00	0.57	23.5	21.5	...	-10.0	-12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.13	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.73	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.65	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½% on 3½", 4"; Butler, Pa. ⅛-8". F6. Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼" and 2 points lower on ⅜". W10. Sharon, Pa. M6. 1 point higher on ⅛"; 2 points lower on ¼" and ⅜". Wheatland, Pa., W9. 2 points lower on ⅛", ¼", ⅜". Following make ½" and larger: Lorain, O., N3, Youngstown R2 and 36½% on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5, Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E, Sparrows Point, Md. B2.

Columns C & F, Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6. ⅛-8", Benwood, W. Va. W10, except plus 4% on ⅛" plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4". Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ¼", ⅜", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Wheatland, Pa. W9, add 2 points on ⅛", ¼", ⅜". 1 point lower on ½", 2 points lower on 1", 1½", 2". 1½ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½% on 3½" and 4". Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ⅜", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	148	14.81	37.0	16.0	37.0	16.0
6	192	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa, J5; Ambridge, N2; Lorain, N3; Youngstown, Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6-in.; Lorain, N3; Youngstown, Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
¾	13	13.45	16.47	15.36	15.36
1	13	16.09	19.71	15.61	18.19
1¼	13	17.27	21.15	17.25	20.30
1½	13	19.29	23.62	19.62	23.09
2	13	21.62	26.18	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2¾	12	29.63	36.32	29.57	34.78
3	12	32.11	39.33	31.33	36.84
3½	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates— Carbon Base 10%	Plates— Carbon Base 20%	Strip— Cold-Rolled Carbon Base 10%	Strip— Cold-Rolled Both Sides	Sheets— Carbon Base 10%	Sheets— Carbon Base 20%	Cu Base Both Sides
302					19.75	26.24	77.00
						27.50	
304	25.00	29.50			24.50	27.50	77.00
						27.77	
306	30.50	35.00					
310	36.50	41.00					144.00
316	29.50	34.00			26.00	33.92	
						36.50	
317	34.50	39.00					
318	33.50	38.00					
321	26.50	31.00			23.00	33.00	111.00
		32.00					
347	27.50	32.00			24.00	33.50	130.00
						33.83	
405	21.25	27.75					
410	20.75	27.25					
Nickel	33.55	45.15	41.00	54.00			
Inconel	41.23	54.18					165.00
Monel	34.93	46.28					
Copper*			23.70†	29.65‡			

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa., A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S15. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter	
½-in. & smaller than	15
⅝-in. & ¾-in.	18.5
⅞-in. and larger	17.5
Longer than 6 in.	
All diams.	14
Lag bolts, all diams.	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P. Square	Reg. Hvy.
½-in. & smaler	15 15
⅝-in. & ¾-in.	12 6.5
⅞-in.-1-in.	9 1
1⅛-in. & larger	7.5 1
H.P. Hex	
½-in & smaller	26 22
⅝-in. & ¾-in.	16.5 6.5
⅞-in.-1-in.	12 2
1⅛-in. & larger	8.5 2
C.P. Hex	
½-in. & smaller	26 22
⅝-in. & ¾-in.	23 17.5
⅞-in. & 1-in.	19.5 12
1⅛-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg. Hvy.
½-in. & smaler	35 28.5
⅝-in. & ¾-in.	29.5 22
⅞-in.-1-in.	24 15
1⅛-in. & larger	13 8.5
	Light
½-in. & smaller	33
⅝-in. to ¾-in.	28.5
⅞-in. to 1-in.	26

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel, packaged, per cent off list)

6 in. or shorter	
⅜-in & smaller	42
⅜-in. through 1 in.	34
Longer than 6 in.	
⅜-in. & smaller	26
⅜-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in. larger 7 50c

⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point to jobbers. List to list-plus $1

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 108	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	Strip	C.R. Structurals	Bars Wire
301	41.00	34.00	31.25	
302	41.25	36.75	31.50	
303	43.25	40.25	34.00	
304	43.25	38.75	33.00	
309	56.00	55.00	44.75	
316	57.00	50.00	49.25	
321	49.25	48.25	37.00	
347	53.75	52.25	41.50	
410	36.50	39.50	25.75	
416	37.00	37.00	26.25	
420	44.00	47.00	31.25	
430	39.00	31.00	26.25	
501	27.50	26.00	14.25	
502	28.50	27.00	15.25	

Bait. Types 301-347 sheet, except 303 and 309, E2.

Brackenridge, Pa. Sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa. sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S15.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c; 304; 58.50c, 316; 52.00c, 347; 39.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31 25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.25c on 321, 41.25c on 347 R2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, Sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 306, 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	30.00-35.00
Toluol, one deg	26.00-33.00
Industrial xylol	25.00-33.50

Per ton bulk ovens

Sulphate of ammonia	$32-$45
Cents per pound, ovens	
Phenol, 40 (carlots, non-returnable drums)	17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron	Cents
98+% Fe, carlots	17.00
Swedish, c.i.f. New York, in bags	8.85-9.95
Electrolytic iron	
Annealed, 99.5% Fe	42.50
Unannealed, 99+% Fe	36.50
Unannealed, 99+% Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	32.50
Antimony	75.85
Brass, 20-ton lots	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor - Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	33.75
Lead	26.30
Magnesium	75.00-85.00
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	45.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots, 25.00-32.50	
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh; 1000 lb and over	6.00
Less than 1000 lb	6.15
98.8% minus 63 mesh; 1000 lb and over	4.15
Less than 1000 lb	4.25
Molybdenum	
99.9% minus 200-mesh	3.24
Chromium, electrolytic 99% Cr, min.	3.50

METALLURGICAL COKE

Price net net ton

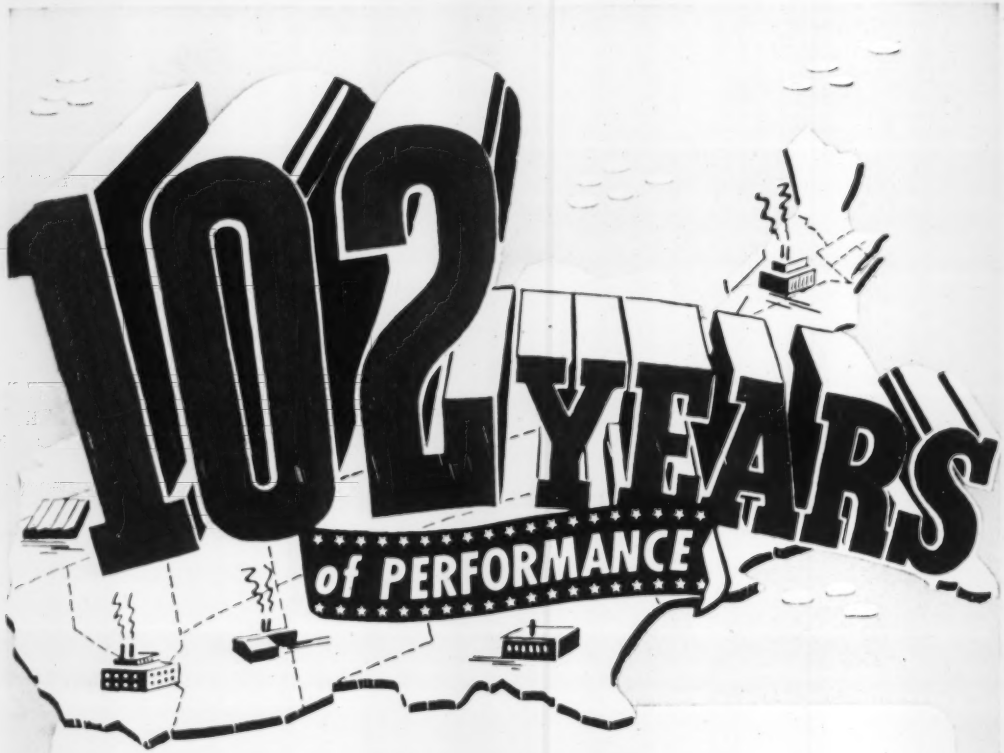
BEEHIVE OVENS

Connellsvill fur.	$14.50-15.00
Connellsvill fdy.	17.00-18.00
New River foundry	21.30
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$22.75
Everett, Mass., ovens	
New England, del.	*24.80
Chicago, ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.42
Cincinnati, del.	25.85
Detroit, del.	26.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Birmingham, del.	21.62
Philadelphia, ovens	22.70
Nevillelsland, Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.80
Flint, del.	26.50
Pontiac, del.	25.47
Saginaw, del.	26.92

* Or within $4.15 freight zone from works.



. . . *Now,* as continuously since its founding in 1850, engaged in the exploration, development and transportation of the basic metal resources of this nation.

IRON ORE • VESSEL TRANSPORTATION

ALLOYS • COAL

THE Cleveland-Cliffs IRON COMPANY

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.40	7.11	8.55	7.05	...	6.49	7.29	9.28	6.37	6.74	7.98
Jersey City (city)	6.10	6.91	8.25	6.75	...	6.19	6.99	10.48	6.07	6.44	7.68
Boston (city)	6.40	7.18	8.65	6.70	...	6.36	7.08	10.80	6.42	6.65	7.84
Boston (c'try)	6.20	6.98	8.45	6.50	...	6.16	6.88	10.60	6.22	6.45	7.64
Phila. (city)	6.04	6.97	8.35	6.60	7.11	6.29	7.16	10.48	6.10	6.28	7.29
Phila. (c'try)	5.79	6.72	8.10	6.35	6.86	6.04	6.91	10.23	5.85	6.13	7.04
Balt. (city)	5.74	7.00	8.40	6.23	...	6.21	6.83	...	6.33	6.33	7.57
Balt. (c'try)	5.54	6.80	8.20	6.03	...	6.01	6.63	...	6.13	6.13	7.37
Norfolk, Va.	6.78	...	...	...	...	6.04	7.30	...	6.30	6.30	7.15
Richmond, Va.	5.74	6.57	8.38	6.14	...	5.91	6.59	...	6.72	6.86	8.00
Wash. (w'hse)	6.05	7.26	8.45	6.50	...	6.50	7.26	...	6.60	6.65	7.86
Buffalo (del.)	5.74	6.52	8.43	6.30	...	5.72	6.65	10.68††	6.02	6.18	7.58
Buffalo (w'hse)	5.54	6.32	8.23	6.10	...	5.52	6.45	10.48††	5.82	5.98	7.38
Pitts. (w'hse)	5.50	6.32	7.85	5.59	6.00	5.45	6.20	10.30††	5.65	5.65	6.89
Detroit (w'hse)	5.79	6.50	8.47	6.15	7.15	5.74	6.84	10.45	6.09	6.14	7.21
Cleveland (del.)	5.74	6.52	8.16	5.85	7.14	5.82	6.60	8.91	6.15	6.02	7.39
Cleve. (w'hse)	5.54	6.32	7.96	5.65	6.94	5.62	6.40	8.71	5.95	5.82	7.19
Cincin. (w'hse)	5.84	6.38	8.29	5.77	...	5.75	6.84	10.49	6.09	6.14	7.28
Chicago (city)	5.74	6.52	8.05	5.69	...	5.67	6.50	10.30††	5.85	5.90	7.09
Chicago (w'hse)	5.54	6.32	7.85	5.49	...	5.47	6.30	10.10††	5.65	5.70	6.89
Milwau. (city)	5.90	...	8.21	5.85	...	5.83	6.81	10.46††	6.01	6.06	7.25
Milwau. (c'try)	5.70	...	8.01	5.65	...	5.63	6.61	10.26††	5.81	5.86	7.05
St. Louis (del.)	6.02	6.80	8.33	6.56	...	5.95	6.88	10.58	6.22	6.27	7.46
St. L. (w'hse)	5.82	6.60	8.13	6.36	...	5.75	6.68	10.38	6.02	6.07	7.26
Kans. City (city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans. City (w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm. (city)	5.75	6.55	6.90§	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm. (w'hse)	5.60	6.40	6.75§	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.50	8.30§	9.50	6.60	10.65	6.45	8.35	11.50	6.50	6.50	8.75
L. A. (w'hse)	6.30	8.10§	9.30	6.40	10.45	6.25	8.15	11.30	6.30	6.30	8.55
Seattle-Tacoma	7.07‡	8.64	9.65	7.70	...	6.70	9.05	10.35	6.54	6.83	8.73
San Francisco	6.64	7.88§	8.85§	6.43	...	6.12	8.20	11.15‡	6.45	6.50	8.50

* Prices do not include gage extras. † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded). ‡ includes extra for 10 gage. § as rolled. ** 16 gauge. †† 15 gage. Base quantities 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ‡ 500 to 1499 lb; ‡ 450 to 1499 lb; § 3500 lb and over; ‖ 1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	$20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	30.00-31.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48%-ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom.

Rhodesian

45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	56.00-51.00

Domestic—rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered, Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered, Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. x M x D, bulk 23.25c per lb of contained Cr, C.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered, Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, SM x D, 16.35c per lb of alloy; ton lot 17.2c, less ton lot, 18.4c, delivered, Spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 21.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant, freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-29%, Al 7.9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: Min 97% Cr and 1% Fe; Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium ton lot $1.10, less ton $1.12. Delivered, Spot, add 5c.

SILICON ALLOYS

25.30% Ferrosilicon: Contract, carload, lump, bulk, 20.00c per lb of contained Si; packed 21.40c, ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered, Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered, Spot, add 0.8c.

Note: Current prices on zirconium, calcium and briquetted alloys appeared on page 179, Apr. 14 issue; manganese, titanium, and "other" ferroalloys, page 213, Apr. 7. Refractories prices were published on page 179, Apr. 14.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.65c, less ton 20.7c. Delivered, Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.00c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.85c, smaller lots 12.15c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.10 per lb of contained V. Delivered, Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max), $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 65c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20. Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%), 10,000 lb W or more, $5.00 per lb of contained W; 2000 lb W to 10,000 lb W, $5.10; less than 2000 lb W, $5.22.

Tungsten Powder: Carbon Reduced, (W 98.8% min) 1000 lb or more, $6.00 per lb of contained W, less than 1000 lb W, $6.15.

* Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952

STEELMAKING SCRAP COMPOSITE

Apr. 17	$43.00
Apr. 10	43.00
Mar. 1952	43.00
Apr. 1951	44.00
Apr. 1947	33.94

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades	
2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00
Elec. Furnace and Fdry. Grades	
11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry Steel	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+ 10.00
29. Shafting	+ 10.00
31. Old Tin & Terne Plated Bundles	— 10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings of scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 5% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	— $2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Bushelling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	— 12.00
8. No. 2 Cast Steel and unsound wheelcenters	— 6.00
9. Uncut Frogs, Switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+ 12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	— 8.00
31. Firebricked	— 6.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise, ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 3, $8.

(3) For crushing Grade No. 6, $3. For preparing into:

(4) Grade No. 25, $6.

(5) Grade No. 19, $6.

(6) Grades No. 12, No. 13, No. 14, No. 18, or No. 20, $10.

(7) Grade No. 17 or No. 21, $11.

(8) Grade No. 18, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.

(4) Grade No. 17, $5.

(5) Grade No. 18, $7.

(6) Grade No. 21, $4.

(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molbdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.

Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 53c; Butler, Pa., 65c.

Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.

Coatesville, Pa., 50c; Conshohocken, Pa., 20c.

Detroit, 95c; Duluth, Minn., 50c.

Harrisburg, Pa., 51c; Houston, 57c.

Johnstown, Pa., 75c.

Kansas City, Mo., 78c; Kokomo, Ind., 51c.

Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.

Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.

St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 31c.

Warren, Pa., 73c; Weirton, 70c.

Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Bushelling	29.50
Bushelings new factory:	
Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

* F.O.B. shipping point.

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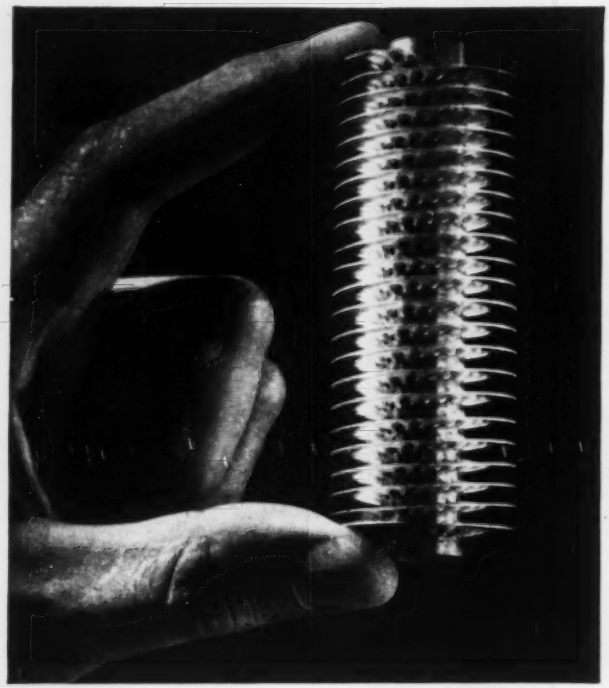
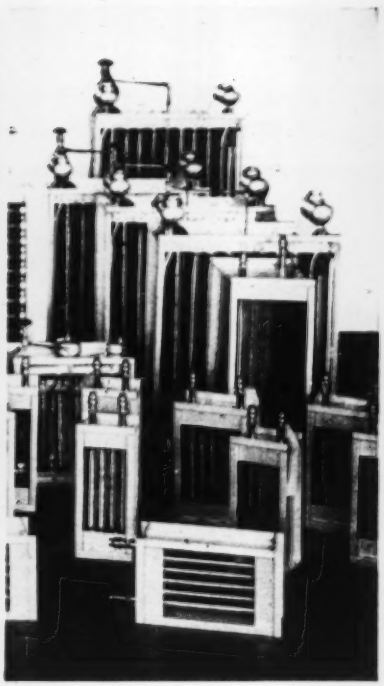
LEADERS IN IRON AND STEEL SCRAP SINCE 1889





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Durability of these stretched and compressed aluminum coils is demonstrated by the fact that they maintain a tight bond to the tube after more than eight years' service. Also contributing to this long life is aluminum's *high resistance to corrosion.*

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Setting the pace—through quality and service

The Metal Market

Faith in the future of expanded and continuous copper supplies is exemplified by American Brass Co.'s sevenfold enlargement of its Chicago copper and brass warehouse to serve Midwest industry. The $1.5 million structure is equipped with power tools for cutting-to-length, shearing and sawing. Brass mill scrap can be handled here too. Above, left is a heavy-duty P & H crane for quick handling of Anaconda copper and copper alloys. Five cranes such as this can move to any spot over the 62,500 square foot floor area. Middle photo shows special band saw for cutting flexible metal hose and tubing. In photo at right hydraulic lifts in each truck bay raise or lower platform to meet varying heights of trucks. The warehouse is now in operation

Copper producers slap back at government, say expansions will yield enough copper by 1956 to support industrial production increase of 22 per cent above today's level

SPARRING SESSIONS between copper producers and the government over adequacy of future copper supply are developing into a championship bout. Producers of the red metal are now swinging from the heels whenever expansion requirements are mentioned.

A roundhouse was landed last week by John A. Coe, American Brass Co. president. "Based on historical comparisons," says Mr. Coe, supply of copper in 1956 "will be sufficient to support a Federal Reserve Board Index of Industrial Production of 270." That's an increase of 22 per cent over today's level and 45 per cent above the first half of 1950.

Looking Up—"The copper situation has already improved so much in recent months that the free world price has fallen sharply," Mr. Coe stated. "Supply is now improving and will accelerate the last two quarters of this year."

Beginning in 1955-56, Mr. Coe estimates expansions in domestic and foreign production will augment world supply by approximately 240,000 tons. Anaconda Copper Mining Co. expenditures alone are calculated to add 125,000 tons of copper yearly by the end of 1953.

The Anaconda Plan—Of this new production, 95,000 tons annually will come from the Greater Butte Project, now in initial operating phases, and the new sulphide plant at Chuquicamata, Chile, which will begin full-scale operations shortly. By the end of next year, Anaconda's new Yerington, Nev., project should be producing at an annual rate of 30,000 tons.

Approximately 80,000 tons annual capacity will be added by other copper companies in the U. S. and friendly foreign countries by the beginning of 1954. At this time copper production should be approximately 205,000 tons per year above present levels.

Flank Attack—Calumet & Hecla Consolidated Copper Co., meanwhile, was making a flank attack on government controls. President Endicott R. Lovell told stockholders that government's illogical and unrealistic policy toward business—highlighted by the steel situation—"will do more to wreck the economy of this country than all the evils that are being used as political bogey men." Its attitude in relation to copper prices, said Mr. Lovell, is a "perfect example of bureaucracy gone crazy."

Phelps-Dodge Corp. chairman Louis S. Cates reports the company's Bisbee, Ariz., East Orebody project, the Lavender Pit, is expected to go into production by the end of 1954. Drilling at the Burro Mountain Branch at Tyrone, N. M., to develop a low-grade orebody that can be open-pit mined is "encouraging though inconclusive," said Mr. Cates. Phelps-Dodge is also going into the oil business, Mr. Cates revealed. Arrangements with two major oil companies near completion provide for joint drilling of exploratory wells.

Zinc, Lead Decontrol Imminent

Removal of restrictions on use of zinc and lead is imminent. By backing claims with fact in Washington, industry is effectively forcing NPA action.

Predictions from Washington of a 102,000-ton zinc deficit in 1952 were sharply challenged by C. R. Ince, vice president, St. Joseph Lead Co. "In a free market there is no such thing as a continuing deficit," says Mr. Ince. He calculates a surplus of 129,000 tons for the year, based on consumption of 889,000 tons and availability of 1,018,000 tons. Minimum imports for the year were estimated at 113,000 tons (the government sets the level at 88,000 tons) and exports at about 50,000 tons (the NPA quota is 72,000 tons).

Nationalized Bolivian Tin?

The government's tin hassle with Bolivia may lead to nationalization of the industry in the trouble-ridden South American nation. After the revolt that restored Victor Paz Estenssoro's National Revolutionary Party government to power, a promise was given to name a special commission to study nationalization.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley, Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis, high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c; corroding 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot, Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 50.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 50.50c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $207-$210 per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55; del.; special or patented shapes $2.80.

Cobalt: 97.99% $2.40 per lb for 500 lb (kegs), $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound; f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze 95% 41.30; 90% 40.82; red brass 85% 39.83; 80% 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90% 43.79; red brass, 85% 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95% 41.80; 90% 41.42; red brass, 85% 40.43; 80% 39.96; best quality brass, 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.54c; 30,000 lb lots, 28.67; l.c.l., 29.17. Weatherproof, 100,000 lb, 30.35; 30,000 lb, 30.60; l.c.l., 31.10. Magnet wire del., 15,000 lb or more, 34.50; l.c.l., 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4	——Hexagonal—— R-317-T4	17S-T4
	17S-T4		
0.125	52.0	...	...
0.156-0.0188	44.0	...	...
0.219-0.313	41.5	...	...
0.375	40.0	46.0	48.0
0.406	40.0	...	...
0.438	40.0	46.0	48.0
0.469	40.0	...	...
0.500	40.0	46.0	48.0
0.531	40.0	...	...
0.563	40.0	...	45.0
0.594	40.0	...	...
0.625	40.0	43.5	45.0
0.688	40.0	...	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	...	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	...	...
1.625	36.5	...	39.5
1.688-2.000	36.5	...	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $24.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $24.00 per cwt. Traps and bends: List prices plus 65%.

ZINC

Sheets 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 25.50-26.50c; over 12-in., 25.50-26.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $19; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 28.00c; 5 tons and over 28.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb, 75.50c; 3000 to 10,000 lb, 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11, more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
90%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes) drained of liquid, 7.65c for 15,000 lb or more; 7.45c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.20c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Apr. 1-17	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Mar. 1-31	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Mar. Avg	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. Avg	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00
1951								
Dec. Avg	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
Nov. Avg	24.50	18.80	19.50	103.00	19.00	44.56	56.50	88.00
Oct. Avg	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Sept. Avg	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

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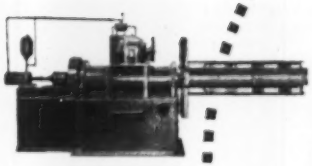
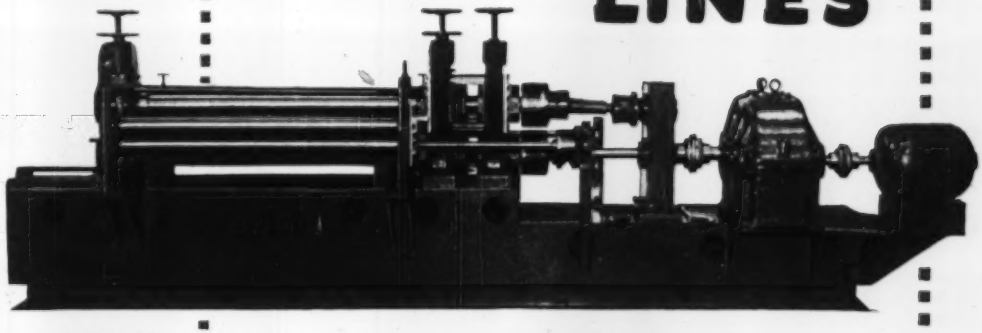


PAY-OFF REELS



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SCRAP WINDERS
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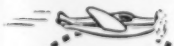

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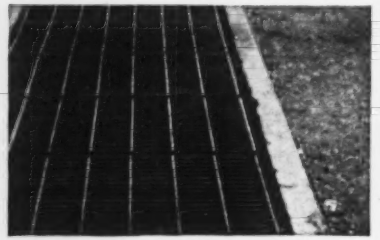

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withstands weight of heaviest trucking, inside or outside of industrial plants . . . excellent for drainage applications . . . for coal grizzlies . . . and wherever it is necessary to sustain unusually heavy loading.

In prominent steel casting plant, Hendrick heavy-duty grating used for breakout floors has paid for itself many times over in reclaimed sand.

Bearing bars range in size from 2¼″ x ⅜″ to 4″ x ⅜″; cross bars from 2″ x $\frac{5}{16}$″ to 2½″ x $\frac{5}{16}$″; to meet requirements of loading conditions. Write for complete specifications.

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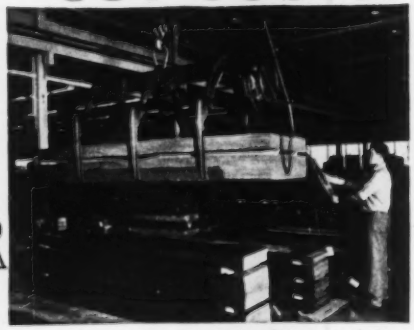

The A. B. Dick Company, Niles, Illinois, found that this C-F Lifter has substantially reduced man hours and crane time required to move stock in and out of storage.

Up to 10,000 lbs. of high grade sheets in varying widths may be picked up, carried and unloaded at shears or machines with speed and economy by the Lifter and its operator.

C-F Lifters are made in standard or semi-special models to handle from 2 to 60 tons. Bulletin SL-25 describes the advantages you can obtain from C-F Lifters. Write for it today.

CULLEN-FRIESTEDT CO.
1308 South Kilbourn Avenue • Chicago 23, Illinois

Tin Plate . . .

Tin Plate Prices, Page 144

Washington—An export licensing quota of 120,000 short tons of production tin plate for food and petroleum packaging was established for third quarter by the Office of International Trade. In addition, a supplementary tin plate quota of 62,500 short tons was established for second quarter. An additional 20,000-ton quota of tin mill black plate also has been made available for export licensing under the Controlled Materials Plan in second quarter.

Sheets, Strip . . .

Sheet and Strip Prices, Page 143 & 144

Cleveland — Local finishing mills were returned to production as quickly as possible following government seizure. However, full operations were not immediately achieved. Substantial tonnage was lost due to the labor trouble. One producer here estimates its flat-rolled production loss will run around 20,000 tons. It may even be higher, depending upon the speed with which the loss in ingot output is made up.

District sheetmakers are booked full through second quarter on the major grades. Indications are there will be a carryover into third quarter, in part, due to the recent work stoppage. Mills had hoped to get current on bookings by midyear but this now seems out of the question despite the easier demand from various consuming directions. Indications are the overflow on cold-rolled sheets into third quarter will take a substantial part of July production. On hot-rolled, indications are it will be August before sellers can catch up with back orders.

New York—Recent disruption in steelmaking operations has tightened the supply situation somewhat in hot and cold sheets. Few if any of the larger mills are in position to accept tonnage before third quarter. Such occasional spot openings as are still noted for nearby positions are quickly filled.

Boston—Heavier water movement of hot-rolled strip to cold strip converters will result from the 6 per cent increase in railroad freight rates, notably through New Haven where two Connecticut mills are taking substantial tonnage via vessel. Flat-rolled consumers confront higher costs, including higher mill prices, transportation charges, and labor in some cases.

Pittsburgh — Producers estimate roughly that approximately 5 days production of flat-rolled was lost here due to the slowdown caused by the steel wage-price situation. While some demand improvement is expected, mills see the picture generally remaining about the same as at present. Pickup in automotive requirements is expected. No trouble is seen in filling third quarter books.

St. Louis — Volume of cold sheet orders has picked up since the strike-seizure shutdown. Mills here lost less than 200 tons as the men were off the job only six hours.

Chicago—Even without the strike output loss at least one sheetmaker here is running a month behind on cold-rolled sheets. This

comes about from a combination of factors including the required 15 per cent overbooking, shift to other products by direction, and production below expectations.

Los Angeles—Pressure of new business on finishing mills is easing but cold-rolled strip tonnage is up 25 per cent over last year.

Steel Bars . . .

Bar Prices, Page 143

Boston—Carbon bar volume booked for third quarter runs substantially to defense tonnage, in numerous instances fixed amounts repeated from second quarter with moderate increases. Civilian pressure for bars beyond the current quarter has eased in most smaller sizes, although orders for resulphurized 1200 series are steady. Some producers are applying $1 extra for this series and others are not.

Contracts were placed by Springfield armory for 855 tons with Republic Steel Corp., Massillon, O., and 112 tons, with the Steel & Tube Division, Timken Roller Bearing Co., Canton, O.

New York—Carbon bars continue in tight supply. This product along with heavy gage plates is perhaps the most scarce of all major steel items.

Philadelphia — No letup in carbon bar demand is apparent. Inquiries continue heavy from drop forgers, shipyards, railroads, cold-drawers and others including shell specifications.

Pittsburgh—Bar supply will be tighter in the weeks ahead because of the lost production in this district due to the production suspension over the wage-price issue. Approximately a week's production was lost.

Cleveland—Tight supply conditions in the bar market are intensified by the production lost from the threatened strike. While mills resumed operations promptly following government seizure of the plants, the substantial tonnage lost will add to supply difficulties over coming weeks. Carryover from second to third quarter will be larger than anticipated.

Plates . . .

Plate Prices, Page 143

New York—Eastern plate mill production is fully restored. Actually, output along the seaboard did not lag because of the strike threat as much as in other major producing districts for the reason that two producers were not forced to suspend at all because of their previous agreements with the union. Two others lost only a little more than a day and a half. Heavy gage plates remain in strong demand.

Boston—Volume of light plates is beginning to approximate inventory limits with more fabricating shops, including small tank builders. While third quarter orders are being placed, little tonnage beyond July is offered. In light plates producers again are soliciting business. The reverse of this is the case with wider and heavier plates. Consumer inventories are limited and third quarter openings are filling more rapidly.

Philadelphia—Heavy gage plate is in strong demand and there is enough pressure for sheared plate in

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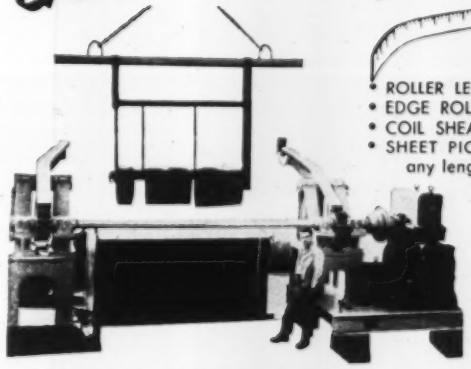

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the lighter gages to round out operations at most mills. Only at the extra high premium mills does there appear to be any particular lag in demand.

Pittsburgh—Most serious effect of the output loss resulting from the steel labor trouble will be felt in the heavier and wider plates. Lighter material, which is being rolled on continuous hot-strip mills, will not be affected to the same degree.

Seattle—Largest plate award recently, 7000 tons for Chief Joseph dam penstocks, was awarded Consolidated Western Steel Corp.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 143

Chicago—Supplies of reinforcing bars are easing. Competition for construction work is increasing.

Seattle—Reinforcing steel orders exceeding 4000 tons were booked by mills last week.

Semifinished Steel . . .

Semifinished Prices, Page 143

Pittsburgh—Steelmaking operations here snapped back after the shutdown and seizure of the industry to 102 per cent of rated capacity, increase over the strike-week's revised rate of 62 per cent. Wheeling district operations were pegged at 101.5 per cent of rated capacity, rise of 12.5 per cent over the preceding week's revised rate of 89 per cent.

Detroit—While other area mills lost some tonnage in the week ended Apr. 12, Ford Motor Co.'s open hearth operations at the Rouge plant established a weekly output record. Production was 30,234 tons, the first time the 30,000-ton figure has been passed.

San Francisco—Bethlehem Pacific Coast Steel Corp. lost two turns, or 400 tons of steel ingots, at its South San Francisco plant because of the recent labor disturbance. Columbia-Geneva Division, U. S. Steel Co., lost 22,000 ingot tons: 21,000 tons at Geneva, Utah, 750 tons at Pittsburgh, Calif., and 250 tons at Torrance, Calif. Additionally, 15,000 tons of pig iron were lost at Geneva.

Chicago—Finkl & Sons, this city, Apr. 3 produced first heats of steel in one of two 20-ton electric furnaces under installation the past 18 months. The second furnace will be ready soon. The two units will provide the company 53,000 tons of carbon and alloy ingots annually for its own forging operations.

Structural Shapes . . .

Structural Shape Prices, Page 143

Washington—More than twice as much structural steel for commercial construction should be available in third quarter than was available in second, barring further curtailment in production, it was disclosed last week by the Defense Production Administration in announcing allotments for third quarter.

Allotment of structural steel for third quarter for industrial expansion was 183,000 tons against 268,140 in second quarter. For commercial construction the allotment is 40,000 tons against 16,285 in second quarter. The Bureau of Public Roads was given 125,000 tons, compared with 80,000 in the preceding period. The Federal Security Agency's third quarter allotment for education and hospitals was increased by some 10,000 and 7000 tons, respectively.

Boston—Structural fabricators are not yet out of the woods when it comes to balance in inventory. Allotted tonnage beyond specified job requirements is limited and, while more plain material is available in this category, wanted sizes are frequently lacking. Bridge and direct defense installations are taking more steel, also schools, housing and hospitals in the lower tonnage levels.

New York—Easing in governmental restrictions on commercial construction has been an important step toward greater building activity in this district. However, under government credit control builders have to advance sums amounting to about 50 per cent of the estimated cost of the project. Normally initial financing amounts to about one-third of the cost and appeals are being made to Washington for a relaxation in credit control.

Philadelphia—Apart from scattered bridge work and one outstanding government job, structural activity is limited. Some of this slack may be ascribed to the steel wage controversy and uncertainty as to its ultimate bearing on costs. Also to greater conservatism with regard to industrial construction. One district fabricator received two cancellations comprising industrial work.

Pittsburgh—Mills anticipate a definite pickup in demand for shapes due to relaxation by NPA on building controls. Much of the expected business is in the engineering stage and will not develop into steel orders for some months.

Cleveland—Structural fabricators anticipate some improvement in building activity over coming months as result of the easing of government restrictions beginning July 1. Considerable work is in prospect, including numerous public jobs temporarily held up for lack of steel. Building operations in the greater Cleveland area are described as satisfactory. In first quarter this year 4226 building permits valued at $43,804,160 were issued in the district for residential and industrial construction.

Tubular Goods . . .

Tubular Goods Prices, Page 147

Cleveland—Lost production as result of mill suspensions over the period of labor trouble will add to pipe supply difficulties through remainder of second quarter. All of the mills are booked full for the period and the lost tonnage may result in pushing some scheduled second quarter shipments into third quarter. This, however, is not definitely determined. Currently, demand for pipe continues strong though pressure for shipments is off from jobbers, some of whom are reported taking less tonnage than they had been allotted for second quarter. Sun Pipe Line Co. plans a 110-mile petroleum line in northern Ohio tying together refineries at Marcus Hook, Pa., and Toledo, O. The 8-in. interconnection between Fostoria

and Hudson, O. will have daily capacity of 17,000 barrels and will cost $3 million. Bids will be asked June 1 and completion is scheduled for Sept. 30.

Los Angeles—Western Tube Corp. is constructing a $16 million, 500,000 sq. ft. seamless tube plant at Dominguez. Seamless oil-well tubing, drill pipe and casing will be produced. The plant will fabricate 100,000 tons of oil country tubular goods yearly. G. C. Hoyt, formerly executive vice president of International Harvester Co., is president.

Fluorspar . . .

Fluorspar Prices, Page 147

Cleveland—Strong demand for acid fluorspar has taken the market play from the metallurgical and ceramic grades in recent months. This reflects the expanded requirements for hydrofluoric acid in production of aluminum, high octane gasoline and in the atomic energy program.

Wire . . .

Wire Prices, Page 145

Philadelphia—Contracts for 1230 tons of electrodes, mostly steel, have been placed by the General Store Supply office, Philadelphia, Navy Department. Largest orders went to A. O. Smith Corp., Milwaukee, and Metal & Thermit Corp., East Chicago, Ind.

Boston—Most wire mill finishing departments are operating well below capacity. Integrated mills lost nearly one week's output of ingots because of the labor trouble, but ample rod supply minimizes the effect of this on rolling schedules. Although orders are not impressive, the wave of cancellations and backlog revisions has subsided with consumers gearing second and third quarters to estimated requirements.

New York—Slight improvement in demand for wire products by the automotive industry reflects prospects for heavier production and refutes in part reports of excessive inventories.

Pittsburgh—Overall demand for wire products is good. Some spots in high carbon have been somewhat weak due to decreased allotments to the automotive trade for spring wire. However, low carbon has filled in most of the vacant spots in schedules.

Cleveland—Pickup in automotive requirements for spring and upholstery wire is serving to offset some of the slack in wire products demand. Volume of business is described as substantial. The pressure for tonnage, however, does not compare with that of a year ago. Easing of building restrictions is expected to stimulate demand for wire items, such as nails, used in construction.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 147

Cleveland—Oven coke supply is adequate for all current foundry requirements with the melt still curtailed. Users' inventories are comfortable. The recent threatened work stoppage in the steel industry did not stimulate protective buying to any extent.

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Pig Iron . . .

Pig Iron Prices, Page 142

Cleveland — Merchant iron sellers are under less pressure for tonnage from the foundries. However, they still are able to dispose of all their output and no yard piling of iron is reported. Although melters now are permitted 60 days' inventory, as against 30 previously, they are not rushing the market with orders. Even the threatened suspension of production because of labor trouble did not spur protective covering to any noticeable extent. This sluggish foundry demand reflects the slow current pace of castings production, especially by the small jobbing shops, as compared with a year ago. All but two of the district's nine blast furnaces are in production. All of them were down several days during the period of strike suspension. One Jones & Laughlin stack, down for relining and repairs prior to the general suspension of production, is not yet ready to resume. One of two stacks of the American Steel & Wire Division, U. S. Steel Co., also is out for relining. This stack, which will be down about 30 days, was not returned to production following government seizure for the reason it had been scheduled for relining. Republic Steel Corp., operating all five of its blast furnaces, last midweek lighted a newly constructed furnace, No. 6, just completed. This new stack has capacity of 1470 tons daily.

Boston—Consumers of foundry iron, including malleable, will be able to maintain operations at current rates until Mystic blast furnace again is producing.

New York—Pig iron demand is flowing more actively following resumption of production at furnaces banked during the recent labor trouble. At one time only three seaboard furnaces were in operation. District foundries are no longer pressing for iron, although most are willing to take further tonnage so as to increase the ratio of iron to scrap.

Buffalo—While softer tendencies are noted in some areas of the merchant pig iron market, sellers here report demand sufficient to absorb output.

Philadelphia—Pressure for foundry iron is off but district sellers have no difficulty disposing of tonnage.

Pittsburgh—With all stacks down recently due to the steel labor dispute with the exception of Weirton Steel's three furnaces, approximately three days' production was lost. This is not too important here as foundry business continues only fair. Foundrymen are getting their production back to normal levels which by comparison with last year's output looks poor. All furnaces are back in operation with the exception of one at Bethlehem Steel's Johnstown, Pa., works and three U.S. Steel stacks at the Duquesne, Donora and Edgar Thomson plants.

St. Louis—Foundry iron shipments were heavy last week as Granite City Steel Co. put on the market 10,000 tons its blast furnaces had stockpiled in anticipation of a two-week strike.

Birmingham—Merchant iron supply is in better balance with demand but the situation cannot be described as easier. Some of the pressure is off district sellers. But they are able to dispose of all the tonnage they can produce.

Scrap . . .

Scrap Prices, Page 150

Pittsburgh—Scrap is fast getting back to normal in this district following the setback in operations occasioned by the steel wage-price ruckus. Shipments to mills are substantial. Good open-hearth material is scarce here with electric furnace charge somewhat easier. Cast is a drug on the market and some sales of No. 1 cupola have fallen to $46.47 in the metropolitan area. Other scrap prices remain at ceiling.

New York—Steel scrap again is moving on a normal basis. Most mills hold fair inventory and are not pressing too hard for tonnage. Demand for cast scrap lags.

Buffalo—Decided improvement is reported in the flow of scrap. All threats to curtailment in steel production because of the scrap shortage have vanished.

Philadelphia—Consumers hold more than two weeks' supply of steel scrap against less than a week a short time ago. Normally at this season stocks range from 45 to 60 days. Mild weather should stimulate the flow of material. Railroad and industrial scrap continue under government allocation but dealer scrap is no longer being apportioned among consumers.

Proposed increases in freight rates will be for the account of consumers except in a few instances, such as in cupola cast and unstripped motor blocks where prices have fallen below ceiling levels and are being bought on a delivered basis.

Cleveland—Quality grade steelmaking scrap is scarce and the mills are pressing for tonnage. No. 2 heavy melting is more plentiful and buyers are exerting selectivity in their acceptances. No ill effects are noted as result of the recent interruption in steelmaking operations attending the wage dispute. Steel grades are moving steadily to the mills. Blast furnace grades, however, are in sluggish demand and the foundries are not actively buying the cast grades despite offered price concessions in the form of freight absorption.

Detroit—Intake of steelmaking scrap was normal last week. Barring another close-down in steel, mill operations are expected to show a gradual downturn. Pressure on scrap prices is anticipated. Cast grades remain relatively motionless. Top quality material is sought by a few melters at prices close to ceiling.

Chicago—Movement of scrap was restored to normal quickly after the production suspension ended. As a result no dislocation of consequence occurred. Plants now have 30 days' stocks. Cast iron scrap continues to drag as gray iron foundries buy sparingly. These grades are below ceiling prices.

St. Louis—Supplies of steel scrap continue to improve. Mills' daily receipts are better. Ground stocks are growing. Quality is improving under tighter specifications. Borings and turnings, in over-supply, are softer. Seasonal increase in rail offerings,

delayed by slow deliveries of new rails, is expected. Laclede Steel Co. last week bought a substantial tonnage of Nos. 1 and 2 heavy melting steel and No. 2 bundles. The cast market continues in distress.

Birmingham — Distinct improvement in availability of heavy melting steel is evident here. Weakness continues marked in the cast grades. Cupola cast is currently quoted at $42 to $43. Some cast grades virtually lack a market at present.

San Francisco—For the first time in months, certain open-hearth grades of scrap are showing signs of weakness. This is especially true of No. 2 bundles, reported in relatively easy supply. Some dealers expect this grade will be under the ceiling price soon. Cast grades continue weak, although No. 1 cupola cast holds unchanged at $42, delivered.

Seattle—Scrap supply prospects are brighter as receipts increase from nearby points. Buyers now can eliminate excessive freight costs by not drawing metal from distant points. Inventories are comfortable. The largest buyer here is declining offers of auto blocks and other cast iron items, and is curtailing purchases of bundles.

Warehouse . . .

Warehouse Prices, Page 149

Boston—Demand for galvanized sheets is in excess of supply with warehouse operators hopeful that an estimated 20 per cent increase in production will materialize. Distributors got 40 per cent of the 1,985,000 tons produced last year.

Philadelphia—Warehouses are unable to keep up with demand for hot and cold-rolled carbon bars, heavy plates and shapes.

Pittsburgh — Slight surge in scare buying due to apprehension over the steel labor dispute has subsided. Operators are happy that NPA withdrew its order which cut off shipments for civilian end-uses.

Cleveland—With receipts from the mills improving steadily, local warehouses report their stocks are getting into better balance and they are in position to more satisfactorily serve customers on most products. Large bars and heavy plates continue to present the cheif supply headaches. Demand is described as somewhat stronger than it had been reflecting, largely, seasonal pickup. Some minor price adjustments under OPS regulation 98 are being effected currently. Freight rate increase just granted the railroads does not go into effect until early next month so that it will not be reflected in warehouse prices until after June 15 at earliest. Warehouses are seeking a revision in CPR 98 to permit them to adjust their prices, up or down, in step with mill prices and freight costs. Under the present regulation warehouse price adjustments lag 45 days behind.

Chicago — Steel warehouses are carrying about 50 per cent of normal stocks compared with 30 per cent six months ago. Some products have not improved to this extent but for the general run inventory building is continuing and at accelerated pace.

Seattle—Scare buying in the warehouse market, occasioned by fear of an extended mill shutdown, was shortlived.

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4200 tons, Tishman office building, 99 Park Ave., New York, to Bethlehem Steel Co., Bethlehem, Pa.

2100 tons, addition, state hospital, Central Islip, L. I., through Turner Construction Co., New York, to Grand Iron Works, that city.

2000 tons, miscellaneous structures in Nevada, for Anaconda Copper Mining Co., New York, to the Vinnell Co.

2150 tons, hangar, Hunter Air Force base, Savannah, Ga., to the Savannah Machine & Foundry Co., that city.

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1250 tons, South Shore municipal incinerator, Brooklyn, N. Y., through Grove Sheppard, Wilson & Kruge general contractor, to Lehigh Structural Steel Co., Allentown, Pa.

1138 tons, 60-ft. interlocking steel sheet piling, U. S. naval construction battalion center, California, to Columbia-Geneva Steel Division, U. S. Steel Co., Los Angeles.

735 tons, mill building, Morris Plains, N. J., through Walter Kidde Co., to Schacht Steel Construction Inc., New York.

600 tons, three smelter buildings, Montana Ferroalloys Inc., reduction plant, Memphis, Tenn., to Leckenby Structural Steel Co., Seattle.

270 tons, building, U. S. Rubber Co., Passaic, N. J., to the Gilmer Iron Works, Jersey City, N. J.

240 tons, meter shop, Public Service Electric & Gas Co., Springfield, N. J., to B. Katchen Iron Works Inc., Newark, N. J.

200 tons, turbine generator supports, Connecticut Light & Power Co., Montville, Conn., to Bethlehem Steel Co., through United Engineers & Constructors Inc., Philadelphia.

155 tons, state bridge, Swift river, Rumford, Mexico, Me., to American Bridge Co., Pittsburgh; Verrier Construction Co., Portland, Me., general contractor.

150 tons, Adley Express terminal, Trenton, N. J., to Belmont Iron Works, Eddystone, Pa.

125 tons, shelf angles, Diamond apartments, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

5400 tons, Palisades dam and powerhouse, Snake river, Idaho; J. A. Jones Construction Co. and Charles H. Tomkins Co., low joint bid to Bureau of Reclamation, Idaho Falls, Idaho, $28,781,628; 14 per cent above government estimate.

3000 tons, first section, Army cast armor plant, Birdsboro, Pa., bids asked by Valley Forge Associates, Philadelphia; second section, requiring similar tonnage, will be out later.

1500 tons, double cantilever maintenance hangar, air base, Limestone, Me., project revived, bids to U. S. Engineer, Boston.

972 tons, state bridge work, Onondaga county, New York, bids Apr. 30.

700 tons, six automotive shop buildings, Army, Aberdeen, Md., opening of bids postponed to Apr. 21.

400 tons, electronics building, naval air base, Quonset Point, R. I., bids to U. S. Engineer, Boston.

317 tons, state bridge work, Onondaga county, New York, bids Apr. 30.

300 tons, plant building, I-T-E Circuit Breaker Co., Philadelphia.

250 tons, Eklutna, Alaska, power plant, bids soon to Bureau of Reclamation, Denver.

150 tons, plant addition, Keystone Drawn Steel Co., Spring City, Pa., bids closed Apr. 17.

125 tons, galvanized structures and towers, Tacoma light department; Bethlehem Pacific Coast Steel Corp., Seattle, low $51,267.

100 tons, plant building, DuPont interests, Dunbarton, S. C., bids closed Apr. 18.

100 tons, additional building 16, naval air base, Quonset Point, R. I., bids to U. S. Engineer, Boston.

Unstated, 398-ft. 5-span deck girder bridge, Chena river, Fairbanks, Alaska, government to furnish part of steel; bids to Alaska Road Commission, Juneau, Alaska, Apr. 30.

Unstated, $650,000 hangar for Pan American Airways, at Seattle-Tacoma airport; materials allocation granted; bids in May.

Unstated, steel lead shop, bids to Atomic Energy Commission, Idaho Falls, Idaho, Apr. 23.

REINFORCING BARS . . .

REINFORCING BARS PLACED

3000 tons, permanent barracks, Ft. Lewis, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; general contract to Macdonald Bldg. Co., Inc., Tacoma, and Howard S. Wright & Co., Seattle, low $7,368,963.

850 tons, University of Washington men's dormitory, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Strand & Sons, Seattle, general contractor.

140 tons, Washington state bridge, Snohomish county, to Bethlehem Pacific Coast Steel Corp., Seattle; Matson Construction & Engineering Co., Seattle, general contract low $211,190.

REINFORCING BARS PENDING

7250 tons, Palisades dam and powerhouse, Idaho; bids in to Bureau of Reclamation, Idaho Falls, Idaho.

950 tons, substructure, surface roads and approaches, sections 0-1 and H-1, Fitzgerald Expressway, Boston; V. Barletta Co., Boston, low.

450 tons, Eklutna, Alaska, powerhouse; bids soon to the Bureau of Reclamation, Denver.

200 tons, Washington state highway bridges, Clark, Whatcom and Snohomish counties; general contract awarded.

Unstated, Oregon state highway projects, including three bridges in Marion county, 340-ft. viaduct, Clatsop county, 368-ft. bridge, Hood River county and 100-ft. bridge, Wasco county; bids to State Highway Board, Portland, Oreg., Apr. 21, 22.

PLATES . . .

PLATES PLACED

7000 tons, penstocks Chief Joseph dam, Washington state, to Consolidated Western Steel Corp., Seattle; Columbia River Constructors, general contractor.

1300 tons (previously reported 1000), 41 tanks for kraft plant, Weyerhauser Timber Co., Everett, Wash., to Consolidated Western Steel Corp., Seattle.

625 tons, tanks, Socony-Vacuum Oil Co., New York, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, two 120-ft. river tugs for Alaska railroad, to Albina Engine & Marine Works, Portland, Oreg., $880,000.

120 tons, fuel tank, Tacoma light department, to Consolidated Western Steel Corp., Seattle.

PLATES PENDING

7300 tons, 33 fuel storage tanks, 1,500,000-barrel capacity, annexes, naval supply depot, Newport, R. I.; naval shipyard, Portsmouth, N. H., and Norfolk, Va.; 29 tanks are of 50,000-barrel capacity, 122 ft. diameter, 24 ft. high; Navy Bureau of Yards & Docks.

3000 tons, Palisades dam and powerhouse, Idaho; bids in.

55 tons, penstock, also 23,700 ft. H piling for Eklutna, Alaska, power project; bids soon to Denver.

PIPE . . .

CAST IRON PIPE PENDING

100 tons (previously erroneously advertised for 2000 tons) 3300 ft. 16 and 12-in. water pipe, H. G. Purcell, Seattle, for the U. S. Pipe & Foundry Co., low to Seattle, $30,266.

RAILS, CARS . . .

LOCOMOTIVES PENDING

Army Transportation Corps depot, Marietta, Pa., 83 lightweight locomotives for operation on wide gage track; General Electric Co., Schenectady, N. Y.

Canadian National, 4 diesel-electric locomotive units, to the Canadian Locomotive Co., Montreal.

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CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Duncan Aids Research Group

A laboratory type sintering machine was donated to Armour Research Foundation, Illinois Institute of Technology, Chicago, by Duncan Foundry & Machine Works, Alton, Ill. The machine will be used for studies of lightweight aggregates for concrete and the treatment of finely divided ores. American Ore Reclamation Co., Chicago, assisted in arrangements for the donation of the sintering machine.

Ryan's Order Backlog Grows

Ryan Aeronautical Co., San Diego, Calif., received a $25 million contract to construct parts for the Boeing Aircraft C-97 Stratofreighter cargo plane. Ryan's backlog for aft fuselage sections, refueling pods, cargo doors and floor beams, and other aircraft parts has reached $70 million.

Gage Maker Expands Plant

A research and engineering building was completed by Industrial Nucleonics Corp., Columbus, O., manufacturer of a beta gage now being used widely in the rubber, plastics, paper and metals rolling industries.

Nesco Acquires Fleck Inc.

Nesco Inc., Chicago, large housewares and appliance firm, purchased the business of Fleck Inc., a New Jersey manufacturer of infra-red broilers. This is the first step in Nesco's plan to widen its product line substantially in the specialty electrical appliance field.

Warren Welding Builds Shop

Warren Welding Works is constructing a maintenance and steel fabrication shop at 3444 San Fernando Rd., Los Angeles.

Ohio Knife Boosts Capacity

Ohio Knife Co., Cincinnati, is adding 30,000 square feet of production space to its present knife-manufacturing plant. The company makes paper-cutting, metal-shearing and wood-working knives.

Plans $1.8 Million Project

Great Lakes Carbon Corp., Niagara Falls, N. Y., plans a $1.8 million expansion and improvement program which may be spread over a three-year period. The major part of the program involves renovation of present facilities. Several new buildings also will be erected. Forty-four furnaces will be rebuilt and some new equipment purchased.

Firm Renamed Kropp Steel

A. C. Woods & Co., Rockford, Ill., changed its name to Kropp Steel Co., a subsidiary of Kropp Forge Co., Chicago.

Ford Forms New Department

A new engineering department established by Ford Motor Co., Dearborn, Mich., will concentrate on creation and design of advanced production cars. Hans A. Matthias will head the department.

Hirschman Offers New Line

Carl Hirschmann Co., Manhasset, N. Y., was appointed exclusive representative in this country for Ebosa, S. A., Grenchen, Switzerland. The new line includes turning and thread chasing machines, second-operation machines, hardness testers, and measuring machines.

Acme Aluminum Expands

Acme Aluminum Foundry Co., Chicago, recently completed and is occupying an addition to its plant. The company now has increased facilities for heat treating, dichromating and finishing of aluminum and magnesium castings.

Dial Names Representative

Dial Screw Products Co. Inc., Woodside, N. Y., appointed Bancroft Industries, Montreal, Que., as its exclusive distributor in Canada. Dial manufactures screw machines and cold-headed products, eyelet stampings and assemblies.

Bendix To Erect Building

Bendix Co., Los Angeles, will construct a $185,000 building on nine acres at Laurel Canyon boulevard and Sherman way, Burbank, Calif.

Herco Opens Warehouse

Herco Pipe & Supply Co., Los Angeles, opened its seventh Southern California branch warehouse at 919 E. Sixth St., Santa Ana, Calif. Les Deffendall is manager of the new warehouse.

Plans Consolidation Move

Engineers Specialty Division, Universal Engraving & Colorplate Co. Inc., will consolidate its Buffalo and Rochester manufacturing operations in a plant it has

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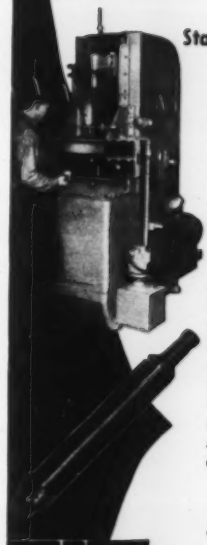

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purchased for $135,000 in Rochester, N. Y. The Buffalo plant will be vacated.

New Firm To Make Furniture

Royal-Walden Corp., a new company, purchased the two-building plant and facilities of Production Enterprises, manufacturer of toys and playground equipment, at Walden, N. Y. The plant will function as a division of Royal Metal Mfg. Co., Chicago, and will produce tubular steel furniture.

Remington To Buy Equipment

Remington-Rand Inc., Buffalo, plans a $1 million expansion at its three plants in Ilion, N. Y. The company will reopen an idle building and will order more than $1 million worth of new equipment. These plants produce office tabulating equipment.

Fullerton Opens New Office

Fullerton Steel & Wire Co. opened its new office building at 6605 Fullerton Ave., Chicago.

National Research Expands

National Research Corp., Cambridge, Mass., opened its $600,000 plant in Newton, Mass. In this plant, the company will engineer, design and fabricate its specialized process equipment for use in the chemical, metallurgical, electronic and coating industries.

Schmitt Moves to New Plant

R. L. Schmitt Co. moved from Wyandotte, Mich., to its new plant at 6536 Roosevelt, Allen Park, Mich. The company manufactures solid carbide tools, end mills, center laps, grinding tools, reamers, midget burrs, and rotary files.

Rosan Resumes Production

Screw machine manufacturing was resumed by Rosan Inc., following transfer of its equipment from a South Gate, Calif., location to a new plant in the former Seacraft Co. boat repair yards at 625 Coast Highway, Newport Beach, Calif. The company also produces gun mounts and will operate a marine service yard.

Phillips Pattern Expands

Phillips Pattern & Mfg. Co., manufacturer of builders hardware, completed additional facilities at 5215 Tweedy Blvd., South Gate, Calif.

Bell Plant To Open in June

Bell Aircraft Corp., Buffalo, will dedicate its new $3 million Helicopter Division plant at Ft. Worth, Tex., on June 6. Equipment already is being moved into the buildings which still are not completed. Most of Bell's helicopter work has been transferred to Ft. Worth where the firm leases two other plants.

Plating Firm Moves Plant

Tonawanda Platers Inc., formerly located in Tonawanda, N. Y., moved its plant to Hamburg, N. Y. It does all types of metal plating work.

Dray Mfg. Enlarges Plant

Dray Mfg. Co., Maywood, Calif., is enlarging factory facilities for manufacture of steel office furniture at 4961 E. 52nd Pl.

Quaker Operates New Unit

Quaker Rubber Corp., a division of H. K. Porter Co. Inc., Philadelphia, is operating its new $275,000 wire braided hose department. Five specially designed braiders are producing high-pressure hydraulic control hose for both military and civilian use.

Rust-Oleum Names Agents

Rust-Oleum Corp., Evanston, Ill., manufacturer of rust-preventatives, appointed as distributors: Adkins Co., Berlin, Md.; Mill & Contractors Supply Co., Wilmington, N. C.; Warren

Ingenuity Is Not Dead

Ingenuity cut expenses at the National Supply Co. plant at Ambridge, Pa., where plant employees made this electric crane using salvaged parts almost exclusively. The H-beams formerly supported meters in the machine shop. The I-beams and channels were from a gas-producer. The only new materials used were some 36-inch end trucks and a piece of steel about 20 feet long and 5 feet wide

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Hardware Co., Warren, O.; American Radiator & Standard Supply Corp., Zanesville, O.; Couch & Heyle, Peoria, Ill.

Hewitt-Robins Moves Offices

Executive offices of Hewitt-Robins Inc. are now located at 666 Glenbrook Rd., Stamford, Conn.

Union Spring & Mfg. Co.

Super Electric Products Corp., Jersey City, N. J., purchased the plant and business of Union Spring & Mfg. Co., New Kensington, Pa., and changed its name to that of the latter firm. The Jersey City plant is now known as the Electronic Division.

Lawrence Machine Expands

Lawrence Machine Co., formerly Livingstone Mfg. Co., is constructing additional machine shop facilities for airplane fittings and angle heads at 8438 Otis St., South Gate, Calif.

Ohio Screw Moves Factory

Ohio Screw Products Inc. moved into its new factory and offices located at 818 West St., Elyria, O.

Ultrasonic Buys Monitor Firm

Ultrasonic Corp., Cambridge, Mass., acquired Monitor Controller Co., Braintree, Mass. Ultrasonic will use the new production facilities for the manufacture of some of its sonic and electronic computer equipment, in addition to continued manufacture of Monitor's motor control and switch gear equipment.

Warehouse Changes Name

KHP Milwaukee Steel Co., Milwaukee, changed its corporate name to Korhumel Steel & Aluminum Corp. of Wisconsin. The new name defines more accurately the products handled in the industrial and building trades. The parent company is Korhumel Steel & Aluminum Co., Evanston, Ill.

Electromet Moves Branch

Los Angeles district sales office of Electro Metallurgical Co., a division of Union Carbide & Carbon Corp., New York, is now located at 2770 Leonis Blvd. The company's district credit and accounting departments remain at 22 Battery St., San Francisco.

Electronics Division Formed

National Electric Products Corp., Pittsburgh, established an Electronics Division with headquarters at its Ambridge, Pa., plant. The television and radio department will be located at the Ambridge plant; the radar department at the corporation's new million-dollar Elizabeth, N. J., plant.

Racine Tool Firm Moves

Racine Tool & Machine Co., Racine, Wis., changed its name to Racine Hydraulics & Machinery Inc. and moved into larger quarters at 2000 Albert St., that city. Expanded facilities and addition of new machine tool equipment are designed to develop an increased production in hydraulic pumps, valves and controls as well as metal cutting machines and railway track maintenance machines.

Allis-Chalmers Names Agent

Virginia-Carolina Electrical Sales Inc., Norfolk, Va., was appointed a distributor of motors and pumps produced by Allis-Chalmers Mfg. Co., Milwaukee. R. Stanley Osborne is president of the distributing firm.

Strong, Carlisle Buys Firm

Sale of Oneida Ltd.'s subsidiary, Oneida Products Corp., Canastota, N. Y., to Strong, Carlisle & Hammond Co., Cleveland, was approved by the stockholders. The Canastota firm makes automobile and trailer parts.

Texas Engineering Renamed

Texas Engineering & Mfg. Co. Inc., Dallas, changed its corporate name to Temco Aircraft Corp. Robert McCulloch is president.

Testing Unit Opens

Materials testing reactor, Idaho Falls, Idaho, designed to produce a flow of intense eration at National Reactor Testing station of U. S. Atomic Energy Commission.

Parker Names Dayton Agent

J. N. Fauver Co., newly established at 1534 Keystone Ave., Dayton, O., will distribute tube fittings, tube fabricating tools and related power plant accessories produced by Parker Appliance Co., Cleveland. The Dayton distributor is a branch opneutron radiation, is in operation of Fauver Co., Detroit.

New England Plant Expands

An addition will be erected soon to New England Butt Co.'s plant in Providence, R. I. The company produces braiding machines and stranding and cabling equipment. John A. Wilson is president of the firm.

Solar Steel Opens Branch

A sales office was opened in Nashville, Tenn., by Solar Steel Corp., a large steel warehouse organization. A. A. Price is manager of the Nashville office.

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Galvanizers Set Sights

Industry alerted to watch competition pricewise and to expect continued heavy demand

GALVANIZED sheet demand will be slightly greater than supply in 1952. This forecast is based on the government's expectation of a 20 per cent increase in production over 1951 which would not entirely eliminate the present shortage.

The 20 per cent production increase would mean about 400,000 additional tons of galvanized sheets. The new continuous line at Bethlehem's Sparrows Point (Md.) mill is expected to result in an increase of some 5000 tons a month, and the new continuous line at Wheeling Steel will be in operation soon.

Distribution — NPA estimates that galvanized demand is exceeding present supply by some 30,000 to 40,000 tons a month. The pattern of distribution is about the same as it was in 1950 and 1951 with 16 major markets accounting for most of the shipments.

James L. Hamilton Jr., vice president in charge of sales, Granite City Steel Co., Granite City, Ill., in his address at the annual meeting of the American Zinc Institute Inc. emphasized the importance of roofing as a market for galvanized sheets. "Currently" he said, "one-third of all galvanized sheets produced in America are eventually converted into metal roofing." He warned that the galvanized sheet steel industry must be alert to the inroads being made by competitive products and asked: "Are we pricing ourselves out of the market?"

Costs Soar—A galvanized sheet in No. 29 gage sells for $167.20 per net ton and the 28-gauge cold-rolled sheet, which is the base sheet before coating, costs $108 a net ton. The zinc coating raises the price, therefore, $59.20. "It's plain that today's substitutes are making the consumer think three or four times before he doles out $59.20 a ton for rust protection," Mr. Hamilton said. The price of zinc increased 280 per cent in the 12 years between 1939 and 1952, while galvanized sheets increased 97 per cent.

Galvanized sheet steel is in a unique position, he concluded. "It's conceivable that the demand for other flat-rolled products could soften, but I do not see this for your industry. There is a great latent market for galvanized sheets.

This dormant buying power will express itself in your market after a balance has been reached in the supply of, and demand for, other flat-rolled products."

HHFA To Test Portable Houses

Seven types of mobile and demountable houses suitable for defense needs will be tested by the Housing & Home Finance Agency between Apr. 22 and May 15. The seven were selected from 36 plans submitted to the agency according to its specifications.

The purpose of the tests is to determine which of the houses could be furnished in sufficient quantity for quick erection at defense installations. Later, after the temporary need passed, the houses could be transferred to permanent sites and erected for long-time use.

Industry Slumps in Britain

Due to a shortage of steel many engineering plants in England are working on a short workweek. The Big Six in the automotive industry (Austin, Nuffield, Vauxhall, Ford, Humber and Standard) occasionally operate on a three or four-day week.

This in turn is affecting the manufacturers of car components whose factories spread over the Midland area. In the soft goods industry approximately 15 cotton mills are shut down part of each week in Lancanshire.

Some surplus labor will undoubtedly be absorbed in defense plants. In the meantime Britain is struggling with a high percentage of unemployment for that country — 2 per cent of the total work force.

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Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
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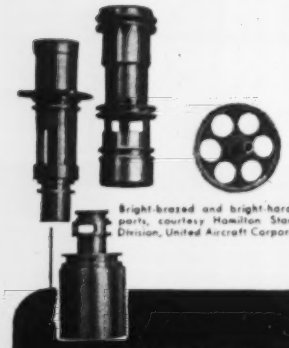

Bright-brazed and bright-hardened parts, courtesy Hamilton Standard Division, United Aircraft Corporation.

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